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A SEMIMONTHLY REVIEW OF MEDICINE AND SURGERY

EDITED BY
GREGORY STRAGNELL, M. D.

VOLUME CXVI

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Radium Therapy in Certain Gynecological Conditions

By SINCLAIR TOUSEY, M.D.,
New York.

Certain properties and physiological effects of radium may be new to some of my readers, though an old story to those who have done a great deal of work with this wonderful element.

A tube of radium or of emanation sends out alpha, beta and gamma rays which have various interesting physical properties but especially connected with the subject under discussion is the fact that the alpha rays are actual particles and are slightly penetrating and that they are arrested by the glass of the tube or by a sheet of paper. This absorbability occurs if under special circumstances they reach the skin and gives them the property of reddening, or inflaming or destroying superficial growths by a painless escharotic action. Practically speaking the alpha rays are not applied by any of the instruments used for gynecological radium therapy. The beta rays are also actual particles, some of them have very little penetration and have therefore a marked rubefacient or escharotic effect, while others are more penetrating and affect deeper tissues as well as the surface, though with an intensity that diminishes as the square of the distance from the radium and directly in proportion to the absorption by the overlying tissues. The third class of radium rays are gamma rays with vibrations much more rapid than the most penetrating x rays. The tissues exert so little absorption upon the gamma rays that the distance from the radium is practically the controlling factor in their effect at different depths.

BETA RAY THERAPY IN GYNECOLOGY.

Unfiltered or slightly filtered radium rays contain an overwhelming majority of the less penetrating rays and are used for a surface effect. The following case affords a specific instance:

Case I.—Mrs. C was referred to me by Dr. James S. K. Hall. She was suffering from an ulceration of the anterior vaginal wall (Fig. 1) presenting every aspect of malignancy and resisting treatment by stimulating or caustic applications. There was imminent danger of the formation of vesicovaginal fistula; and the patient was warned of the possibility and cautioned not to attribute it to the effect of the radium, which was going to be applied in such a way as, if possible, to prevent, not cause, such a distressing result. Practically unfiltered rays were applied in a dose which upon a cutaneous surface would have been followed by redness and eventually desquamation of a layer as thin as paper, leaving a normal healed skin below. I have myself taken about forty such radium applications for the control or cure of x ray keratoses of my hands and face and at first I used to have the exfoliated scabs examined microscopically. The report was invariably that they consisted of epithelial cells without visible change due to the radium. The rays had killed them, but they looked just the same as if they had been removed surgically and put under the microscope. The same report has been received on epitheliomata which have exfoliated. An ulceration of the mucous membrane does not undergo destruction so as to come away as a scab or slough after such an application of radium. The diseased cells are more susceptible to the lethal action of the rays, while the healthy cells are stimulated by the rays.

The result of two applications in fourteen days was that the ulcer quickly assumed a healthy appearance and soon healed. Two years later the patient was perfectly well. Dr. Hall was convinced of the malignancy of the growth, but no section could be removed for microscopical examination without subjecting the patient to the dangers of fistula and metastases. In fact I think it important not to add the risk of general dissemination through the blood channels in any case of possible malignant disease treated by radium. I would far rather have the patient think that I had cured her of something which possibly was not malignant than to present proof of malignancy with the chance of subsequent dissemination and death. The only thing is that in this particular case it presented clinically the appearance of an epithelioma. Other cases are entered on the records as clinically fibromyomata or clinically sarcomata, or recurrences after operation for carcinoma, the latter verified microscopically. The same superficial effect is of the greatest benefit in

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leucorrhea and cervical catarrh, and sometimes by a single application a case can be cured which has resisted chemical applications for months or years.

Erosions of the cervix are frequently cured by a single application of radium of such a nature as to produce the surface effect under consideration.

Fissure of the anus and cases of intolerable pruritus with bleeding cracks in the skin can be cured by a superficial application so calculated as to cause a layer as thin as paper to peel off like a scab leaving a healed, healthy surface underneath. I have often watched the progress of a painful fissure after such an application. There is at first no change in appearance but soon there is an improvement in sensation and in the course of a few weeks a scab or sometimes two or three successive scabs peel off.

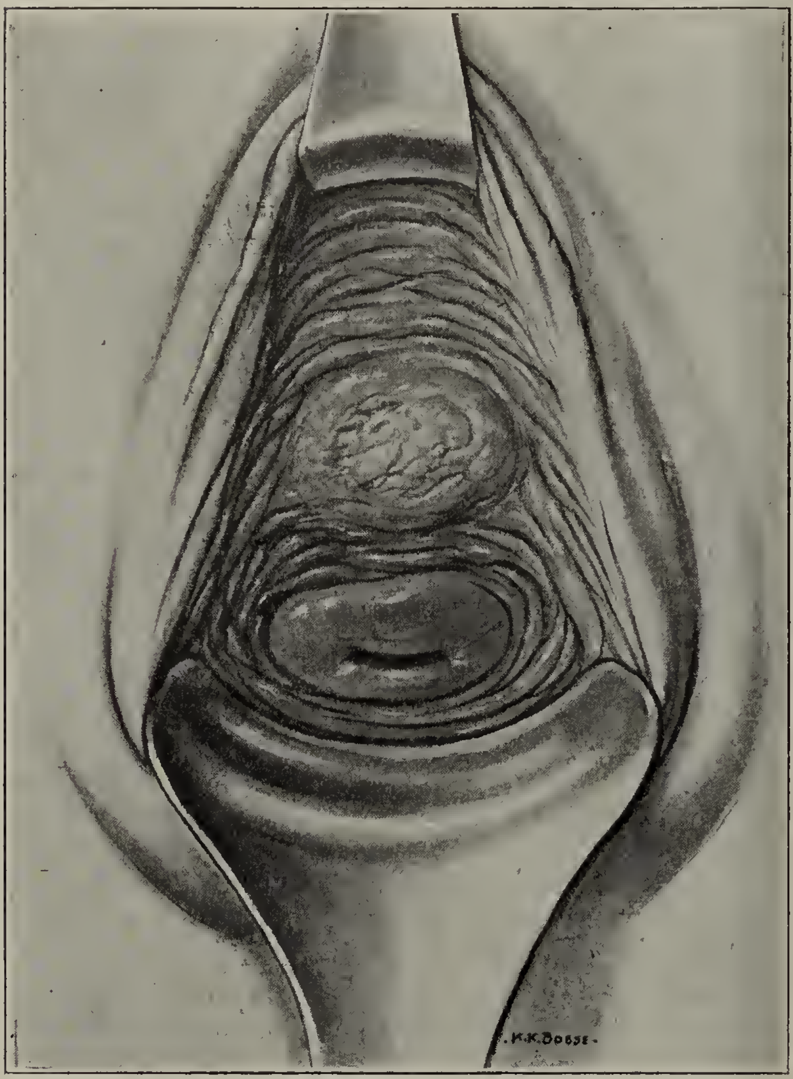

Fig. 1.—Ulcer (malignant?) of anterior vaginal wall cured by radium.

Simple pruritus vulvæ sometimes calls for a radium application to the cervical canal, the pruritus being of secondary origin. And all patients require a series of external applications of a superficial character producing a diffuse effect which need not usually be intense enough to produce a dry desquamation. Sometimes, however, this is necessary and wonderfully beneficial.

The little glistening cysts sometimes seen at the external os, looking like wet beads or like part of a mulberry, are suitable for treatment by these beta rays. In a recent case of an elderly woman with a tumor of unknown nature palpable in the posterior fornix, the presence of a slight cystic degeneration of the cervix (Fig. 2) made me apprehensive of malignancy and called for energetic radium treatment of this surface character.

Urethral caruncle is best treated by the high frequency spark followed by an application of beta radium rays.

To use these soft or beta rays the cases so far alluded to are treated by surface applications of a glass tube containing twenty milligrams of radium and covered with the thinnest rubber tissue. The latter is simply to protect the tube from contamination, not to act upon the rays as a filter. The time of application is usually half an hour to an hour.

With any surface application, of course, at least half of the radiation, that which is directed away from the surface, is entirely wasted. And as a matter of fact the effect upon a neoplasm from a certain amount of radium is five times as great if the radium is imbedded in the tumor. The beta rays can be so applied by using very small amounts of radium emanation one half to one millicurie in capillary glass tubes which are inserted into the tumor through a cannula and left there permanently. About ninety-nine per cent. of the radiation is beta rays. One millicurie of emanation has the same effect as one milligram of radium. But whereas the radium element is practically unvarying in its intensity losing half its strength in eighteen hundred years, the emanation loses half its strength in about four days. One millicurie of emanation left embedded permanently, applies a total of about two hundred millicurie hours and this buried in the tissues is sufficient to destroy any cancer cells within one centimetre of the tube in every direction.

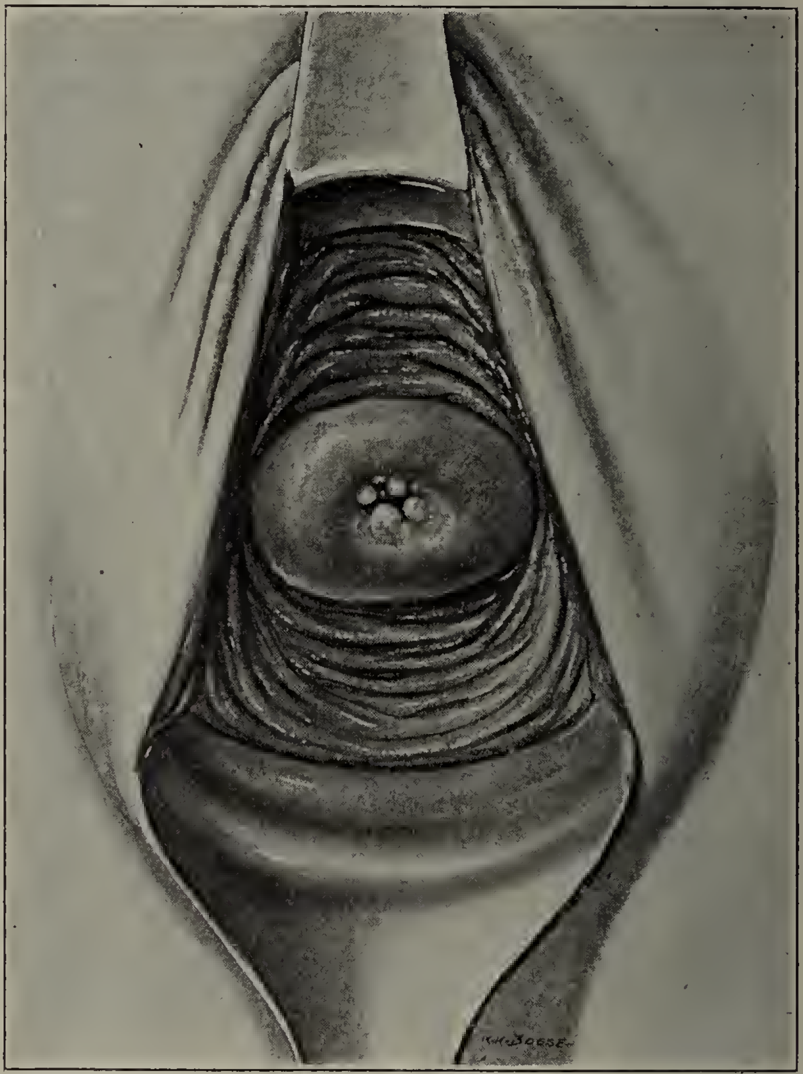

Fig. 2.—Cystic degeneration at the cervix (in a case of pelvic tumor) treated by radium and deep x ray therapy.

Several such emanation tubes may be inserted into a fungating cancer of the cervix with a resulting shrinkage and slight sloughing which produce essentially an amputation of the vaginal portion of the neck of the uterus with eradication of its malignant character. The effect upon cancer cells is not limited to those which actually slough away as is the case with surgery by the knife or the cautery.

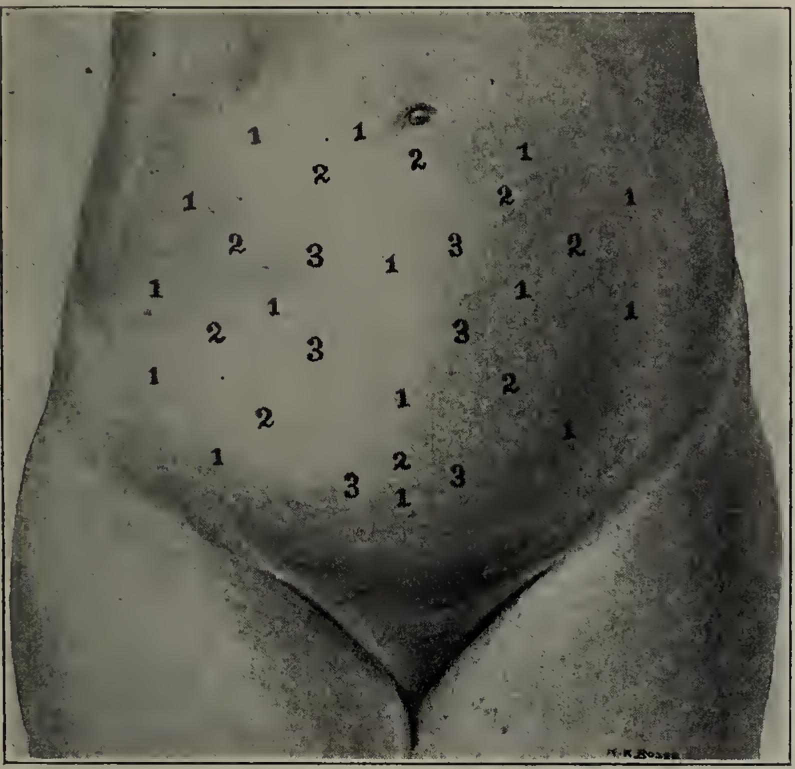

Fig. 3.—External application of radium in enormous uterine fibromyoma; 1 marks the first series of applications; 2 the second, and 3 the final series, as the tumor diminished in size.

FILTERED RADIUM RAYS.

There are many gynecological cases where the effect desired is not limited to the tissues directly in contact with either a surface applicator or an instrument puncturing the tissues. Enveloping the radium in metal suppresses the soft rays and transmits rays which exert some of their effect at deeper parts of the tissues instead of being practically all absorbed by the most superficial tissues. The gamma rays are of this nature and to secure their effect we use a glass tube containing radium element or emanation and enclose that in a metal tube, say brass, or we may have the radium element in hermetically sealed steel needles and place these in brass capsules. The soft rays radiating from the radium are suppressed in this way, but secondary soft rays originate from the metal, and for many cases these rays must be suppressed by a filter of rubber or felt which has practically no effect upon the gamma rays except to make their action upon the tissues more uniform by holding the radium at a little distance from the surface.

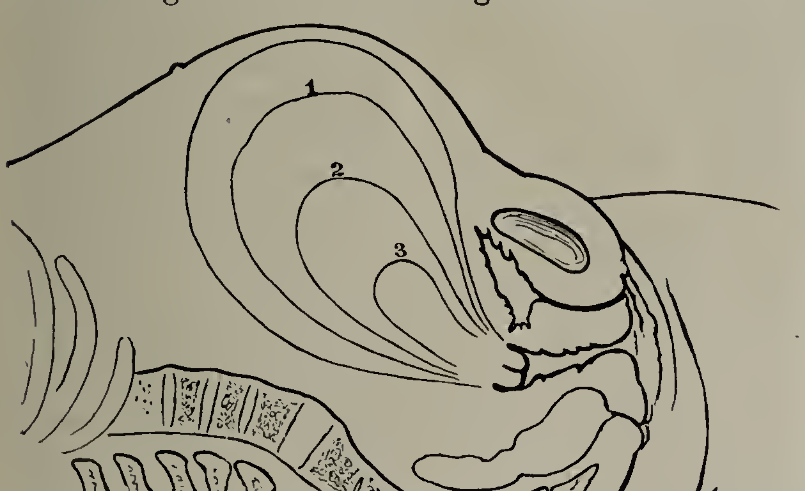

Fig. 4.—Reduction in size of uterine fibroid under radium treatment.

THE EFFECT OF GAMMA RADIUM RAYS.

Like deep x ray therapy, they have a selective action inhibiting cell life of certain normal tissues, such as the spermatogenetic cells of the testis and the essential ovarian cells, and lymphoid tissue wherever found. They have a selective action upon practically all abnormal cells, notably those of a rapidly proliferating type. They may be used to cause an obliterating endarteritis.

RADIUM THERAPY FOR UTERINE FIBROMYOMA.

Radium applications which cure this condition usually produce amenorrhea and often even the very next period is prevented, the hemorrhage ceases, and after a time the tumor is found to have disappeared entirely. It is generally believed that the inhibitory action upon the ovaries is largely to be credited for the beneficial effect upon the fibroid; and it is certain that in the cases in which the fibroid is not cured there is no amenorrhea. These facts have an important bearing and must be considered in deciding whether to treat a fibromyoma in a woman who might desire to have children. Neither the x ray nor radium would promise success with the fibroid and still assure normal reproduction. In cases which I have treated, normal sexual desire and gratification have remained. Regarding the question of symptoms consequent upon the induction of an artificial menopause, they are somewhat the same as those of the natural menopause, but much less severe, and it is my opinion that the occur-

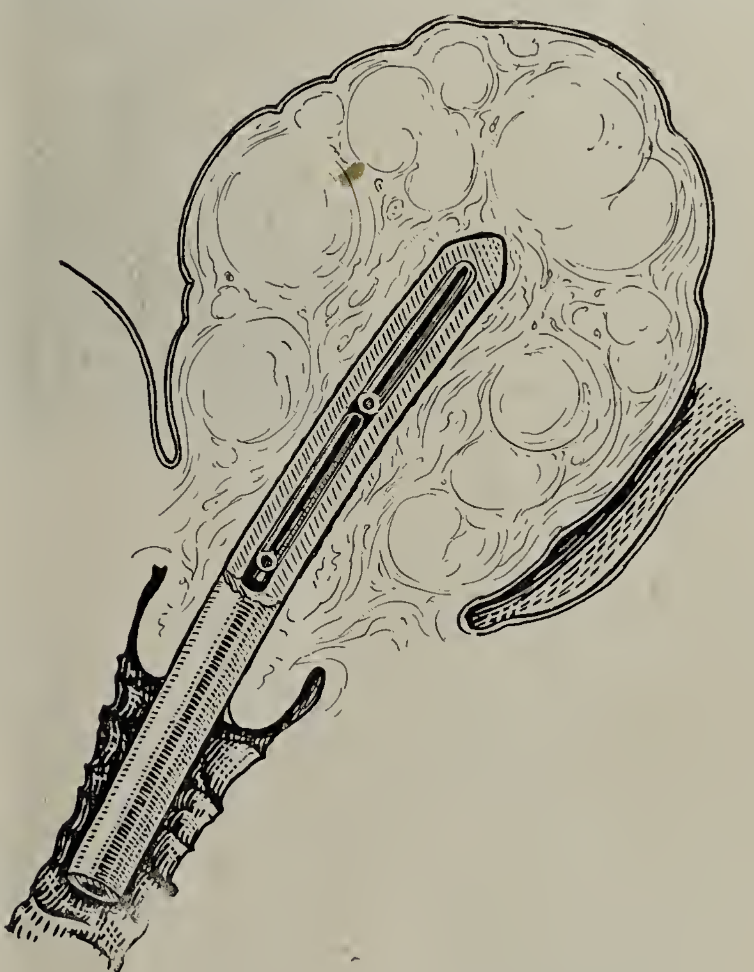

Fig. 5.—Intrauterine application of radium for fibromyoma.

rence of malignant growths of the uterus and ovaries is markedly safeguarded against by this treatment. If an operation was performed it would often be found that the ovaries were affected and required removal and in general few cases of uterine fibroid would promise normal menstruation and reproduction after a surgical operation.

Radium can be successfully applied externally in some cases. In one class the patients are thin, with a relaxed abdominal wall, so that the radium tube in its metal and rubber or felt filters can be pressed into contact with the ovary with only a small thickness of skin and other tissues intervening. Heavy doses with thick filters are required. In another class the patient has a very large fibroid like a full term pregnancy (Figs. 3 and 4) with a thin abdominal wall, and here no effort is made to effect a cure by a single treatment directed chiefly to the ovaries. A fibroid of this size receives also intrauterine applications producing the crossfire effect which is wonderfully advantageous in both x ray and radium therapy.

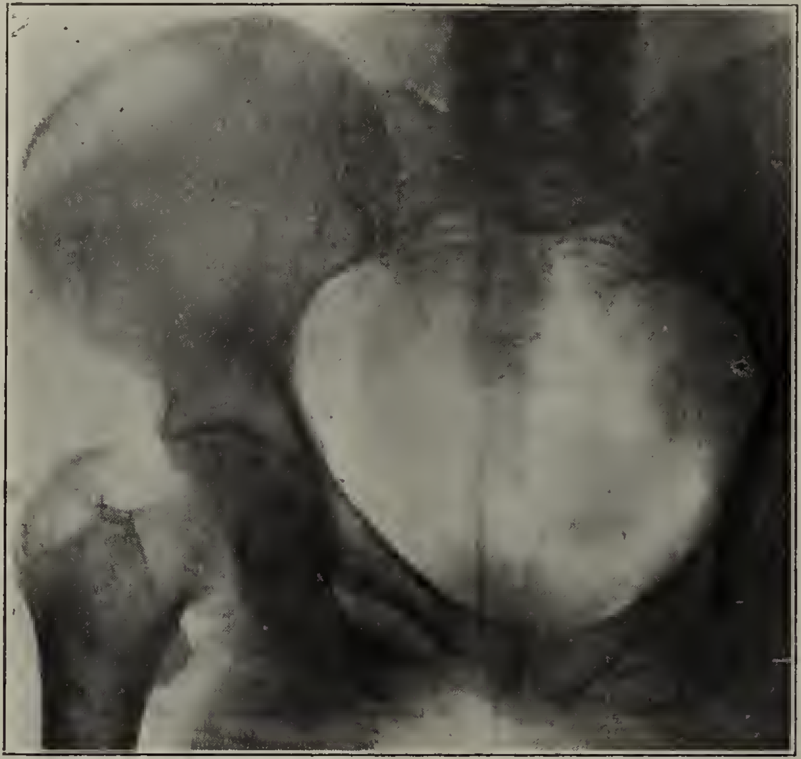

Fig. 6.—Pelvic tumor of unknown nature, treated by radium and deep x ray therapy.

Such a case shows gradual reduction under repeated external radium applications and in the course of a year and a half about thirty thousand milligram hours are applied with a reduction of fifty per cent. in size. There is at first a tremendous area to be treated, one small area after another, and the number of milligram hours required might be employed in treating many other cases. The author's own impulse in such a case would be to use a deep x ray therapy as in the following case.

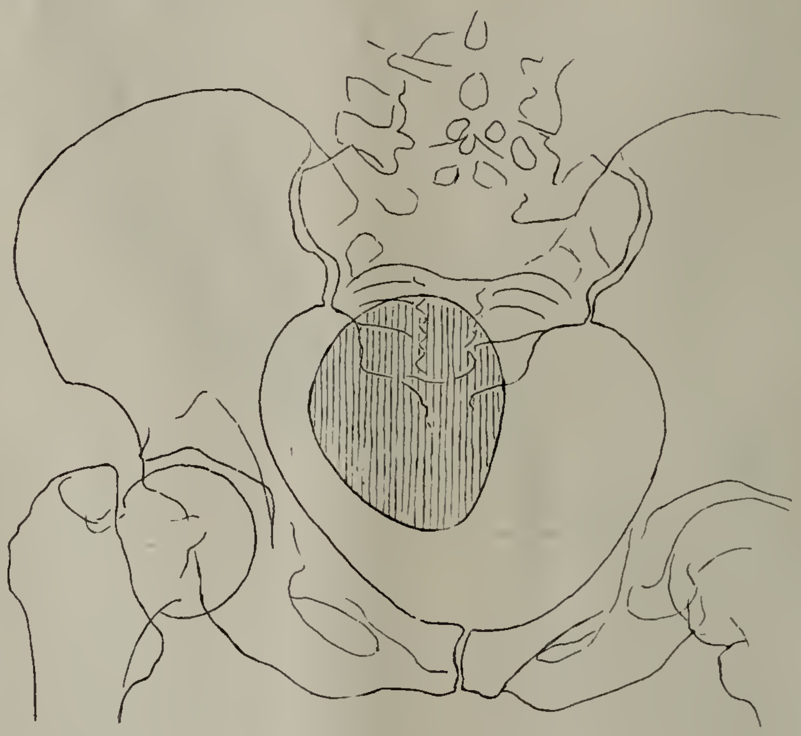

Fig. 7.—Diagram from Fig. 6 of pelvic tumor treated by x ray and radium.

Case II.—Mrs. P. referred to me by Dr. Royle. The patient was forty-eight years old and weighed 160 pounds. She had a fibroid suggesting advanced pregnancy. It had undergone carcinomatous degeneration and there was a great deal of pain, discharge and odor. An operation had been undertaken but on examination under ether the whole pelvis was found to be a solid mass of cancer, so just a small section was taken from the cervix. Microscopic examination showed this to be cancer and it was thought that she had about six weeks to live. My treatment was by x ray applied partly through a celluloid Ferguson speculum which permitted some x rays to impinge directly upon the cervix while others penetrated the perineum and other tissues at the pelvic outlet. Other applications of the x ray were over various parts of the abdomen and back. At first the patient had to come in a carriage with mother, husband, nurse and physician to assist her. The sequence of events was the disappearance of the pain, then of the odor, then later the discharge. There was constant reduction in the size of the tumor and in a few months she was apparently a well woman, coming on a street car all alone and generally with a package of cake or fruit for some sick friend. A year later, however, she died rather suddenly, manifesting stomach symptoms which we thought were due to cancer.

Radium and the x ray go hand in hand in gynecology and of course one or both of these methods of treatment must often be combined with a surgical operation.

A fibroid up to the size of a three months' pregnancy in a patient of moderate size presents an opportunity for simple, specific and effective treatment. Twelve hundred milligram hours intrauterine are commonly applied with complete cure. As an example, a hundred milligrams screened so as to apply only gamma rays may be placed in the uterine canal for twelve hours (Fig. 5). A smaller intrauterine dose may be supplemented by external radium or x ray treatment.

What happens when the radium dosage is insufficient, either intrinsically or from the unusual size of the tumor or of the patient, is shown by the following case.

Case III.—Mrs. D. was referred to me by Dr. T. Spencer Halsey. The patient was thirty-eight years of age and was a giantess. She had a fibroid the size of a grapefruit, practically filling the pelvis and producing some abdominal enlargement. She had hemorrhages which the doctor described as being the most terrifying thing he had even seen. "Just like water running out of a faucet." On some occasions she was almost completely exsanguinated, and her life had been saved with difficulty by packing as hard as a baseball, and the hypodermic administration of ergotin and similar drugs. She had been treated in a hospital with 677 millicurie hours, intrauterine. This had no perceptible effect; she did not even miss a single period. At a latter date and at the same hospital 3,100 millicurie hours were applied externally but this also was ineffective owing to the patient's weight and the distance of the radium from the ovaries. As you know the effect varies inversely as the square of the distance. And as the safe surface effect must not be exceeded, cells at too great a distance cannot be sufficiently influenced.

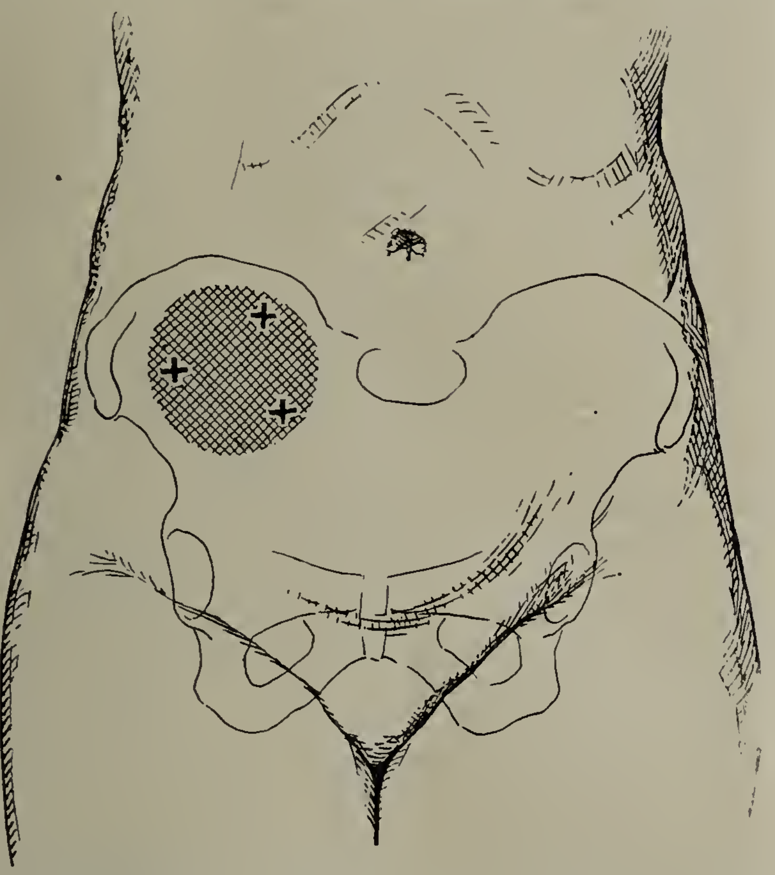

FIG. 8.—Diagram of pericecal tumor. x x x locations of radium tube applied externally.

The size of the patient and of the tumor made successful treatment by radium practically impossible and when she was referred to me I proceeded at once with x ray treatment. The first x ray application was followed by complete amenorrhea lasting one year. On the recurrence of the menstruation another x ray application was followed by amenorrhea and entire disappearance of the fibroids. No return of tumors or hemorrhage. But three years later after remarriage there was a return of normal menstruation and the patient was in such a state of terror that another x ray application was given. She missed the very next period and so far has had no return of menstruation.

CASE IV.—I have recently given a series of treatments for a patient of Dr. P. F. Cavanagh, Mrs. C., aged seventy-four, weight 152 pounds. She had a tumor of unknown nature palpable in the right fornix, and in the radiograph (Figs. 6 and 7) seeming to measure eight by ten centimetres. There were little shiny cysts at the external os which were treated with beta, unfiltered radium rays. No effect upon the ovaries was required in a woman of her age and the main reliance was upon deep x ray therapy applied through several different areas of the skin but all converging upon the tumor. It is too soon yet for any change to be noted in the tumor but there has been a change for the better in the condition at the os uteri.

It may be desirable to curette the uterine cavity and have a microscopical examination before treating a fibromyoma. If this shows malignancy, different treatment would be required.

RADIUM AND X RAY THERAPY FOR MALIGNANT TUMOR ORIGINATING IN THE OVARY.

CASE V.—Mrs. D., aged sixty-six years, 105 pounds, a patient of Dr. Parke, had a malignant tumor including the right ovary removed seven years before she was brought to me for x ray diagnosis. At this time there was a palpable tumor in the right iliac region and almost absolute constipation, she being able to take only liquids strained through a cambric handkerchief. There was a great deal of pain and vomiting and emaciation. My x ray diagnosis was of a tumor not involving the wall of the intestine or requiring an operation upon the intestine; in other words, a pericecal tumor, and I advised x ray and radium treatment after the operation to reduce the probability of recurrence. At the operation the tumor proved to be of a gelatinous character and was taken out with a spoon. Before she was brought to me for radiotherapy, a recurrence of the tumor and all the symptoms had taken place. Deep x ray therapy was applied to different sections of the abdomen and pelvis front and back. Radium was applied over the tumor in a glass tube in an aluminum treatment tube, then lead and finally rubber over all. The places were selected two and a half inches apart in a triangle (Fig. 8), and at each treatment the twenty milligrams of radium were left in each of these positions for an hour. To bring the radium as close as possible to the cancerous cells the patient lay upon a couch with one side close to the wall and with a heavy bowling ball (Fig. 9) resting upon the abdomen and pressing the radium applicator deeply into the right iliac fossa. Under this treatment the tumor, constipation and vomiting disappeared and the patient became able to eat everything, regained strength and became practically well. On one occasion there was a general distention of the peritoneal cavity with a similar gelatinous substance evacuated through an incision. After three years of health and comfort the patient died rather suddenly with pain and vomiting. This was eleven years after the first operation for a malignant tumor.

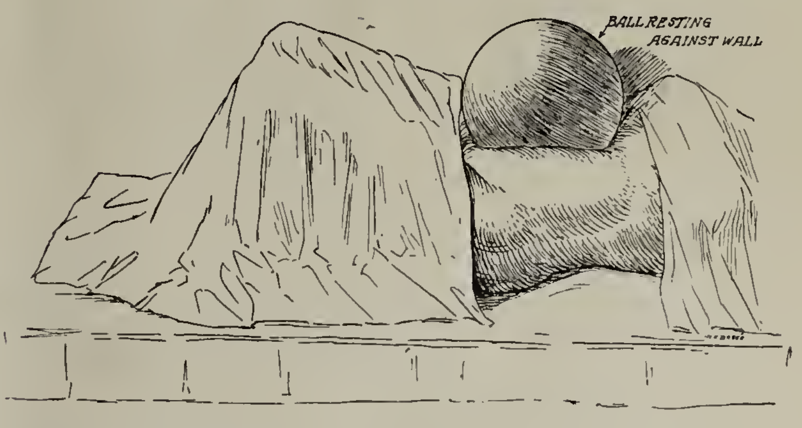

FIG. 9.—Radium applied externally for pericecal tumor. Compression by bowling ball.

CANCER OF THE UTERUS.

I have had a good many patients referred to me by Dr. John M. Keyes, Dr. J. Kumpf and others, for treatment after hysterectomy. These are the hardest cases we have to treat because of the difficulty of applying sufficient radium dosage to the broad ligaments without exceeding the dose which will be tolerated by the vesicovaginal or the rectovaginal wall, and not tend to produce a fistula. The only way seems to be to give a safe dose of radium and combine that with deep x ray therapy. In this way it is possible to convert every cancer cell in the pelvis into a harmless one. This requires great study and even then success is not assured. In every case, however, there is such improvement in strength and comfort and prolongation of life as to make the treatment a desirable one.

RADIUM THERAPY BEFORE OPERATION FOR CARCINOMA OF THE UTERUS.

In many cases it affords a chance for a permanent cure. The radium is applied throughout the uterine canal. It is important to reach the fundus with the first application and give a sufficient dose there. This is because the radium applied first to the cervix, where twice the fundal dose should be used, tends to prevent easy dilatation of the cervical canal. For the body of the uterus the radium is in a glass tube, with metal and rubber filters and gamma rays are applied and the same is true of the cervical canal. The vaginal portion of the cervix may require puncture with steel needles containing ten or twelve and a half milligrams of radium. These are half an inch apart and a full cancer dose is six hours. Or glass tubes of one millicurie or less may be permanently embedded in the cancerous mass. The exact dose depends upon whether deep x ray therapy is going to supplement the radium effect and this the author considers very desirable. This anteoperative radiotherapy should be given about four days before the operation. Given at that time it produces no effect noticeable at the time of operation and neither facilitates nor interferes with the latter, but it does greatly improve the chance for a permanent cure.

RADIUM THERAPY IN INOPERABLE CANCER OF THE UTERUS.

The internal applications are the same as already described for other cases of uterine cancer. They must be supplemented by external applications of either x ray or radium. The case described in the paragraph on fibromyoma with the whole pelvis a mass of cancer shows what can be done with deep radiotherapy alone. Part of the radium application is by a radium bomb, simply a tube of radium inside as large a globula filter as practicable held far up in the vagina by packing. This aims to secure an effect upon the cervix and broad ligaments while exposing the rectal and vaginal wall as little as possible. The deep radiotherapy considered by the author an indispensable adjunct in these cases means x rays of such a quality that a very large percentage will penetrate four inches of water, equivalent to the tissues between the cancer cells and the skin. This means a high voltage, but my tests have led me to the same conclusion as Wintz and Seitz, that beyond a certain voltage no more rapid vibrations are produced, no greater percentage of penetration. There are greater quantity and more rapid effect but this is accompanied by very great danger from the extremely high voltage alluded to and of course the proper filtration is required because of the flood of soft burning rays accompanying the hard ones. Deep radiotherapy, in my judgment, is not a matter of high voltage alone, but also of the proper filtration and crossfire effect and the voltage need not be excessively high.

Of course anyone whose work includes relief of advanced cases of cancer has many sad moments, but one patient who died while I was on my vacation sent word to me by her sister that though she was dying she wanted me to know how much the radium and x ray had relieved her sufferings and prolonged her life.

In a case in which a radium application of forty or fifty minutes' x ray treatment causes the disappearance of a fibroid, but is repeated three years later to allay the patient's fears excited by the return of normal menstruation, I have been asked, "Why not operate and have it finished for all time?" Of course we are talking of a case suitable for radium or the x ray, but which before the discovery of these agents would have been operated upon. The answer is that there is no comparison between the work entailed for the operator, nurses and family, and if my personal experience with an entirely successful exploratory laparotomy with postoperative pain and prostration and several months' convalescence is my guide, radiotherapy in the proper cases would offer very great advantages to the patient even if in some cases it had to be repeated in a few years.

850 Seventh Avenue.

The Uses of Radium in Gynecology*

By THOMAS H. CHERRY, M.D., F.A.C.S.,
New York.

During the last ten years the use of radium as a therapeutic agent has been of great interest to the medical profession. This much advertised element in the hands of enthusiasts has been the means of raising false hopes in it as a cureall for that almost hopeless condition of carcinoma in all its stages. This has produced great harm and brought discredit upon it. In the last few years radium has been used in the treatment of cancer by different reliable institutions and the results observed by unbiased minds. From these observations fairly definite conclusions have been reached regarding its limitations, and the standardization of the dosage has been regulated as applied to the different stages of cancer.

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* Presented before the Washington Heights Medical Society, April 18, 1922.

The main source of radium supply is Paradox Valley, Colorado. Uranium, the mother metal, by its disintegration gives off radium. Radium at present is used in two ways—the emanations and the salts. The emanations are the rays extracted from radium by a specially constructed machine, and collected into glass tubes best suited for its administration. These tubes gradually lose their power in the course of time and must be renewed. The dose by this method is measured in millicuries. This method safeguards the original supply—an item well worth considering when the price is one hundred and twenty dollars a mg.

Radium bromide is the salt used and it is this substance that has been utilized by Dr. George S. Willis and myself in the treatment of gynecological conditions at the Post-Graduate Hospital during the last two and a half years. It is a brownish powder that can be encased in a glass capsule; it can also be imbedded in needles in varying quantities for transfixion of the diseased area. The dose by this method is measured in milligram hours.

Radium rays are divided into the alpha, beta and gamma rays. The alpha ray constitutes about ninety per cent. of the latent energy and has no therapeutic value because it does not penetrate tissue. The beta ray makes up nine per cent. and its power of penetrating tissue is one cm. This ray exerts great irritating effects upon tissue and produces a slough when used. Therefore, it is applied in superficial lesions. The gamma ray constitutes one per cent. of the entire ray and it is this portion that is of value to us in the treatment of gynecological conditions, as it will penetrate ten cm. of tissue.

How do we use the gamma ray? The glass capsule containing the radium blocks the alpha rays. We know that the beta rays will not penetrate one and five tenths mm. of brass, gold, silver or platinum, therefore by screening the capsule with one of these metals the gamma rays alone come into action.

ACTION OF THE GAMMA RAY UPON TISSUE.

The object of applying radium to a growth is to destroy that growth without injury to normal adjacent tissues. Dr. James Ewing has made an exhaustive study of this action upon different tissues and I herewith give an extract from his description: Upon the application of three hundred mg. hours the tissues if examined at the end of five days are found to be hyperemic with beginning exudation of leucocytes, and a swelling of the cells. During the second week the cells are loosened, showing their nuclei swollen and a beginning formation of fusion giant cells. In the third week the cells are greatly reduced in number, some having suffered necrosis; others are invaded and compressed by lymphocytes. In the fourth week only nuclear fragments or an occasional giant cell remains. During this time the stroma of the tumor has become active; there is an infiltration of leucocytes and a proliferation of the capillaries which penetrate and excavate the tumor cell nests. The later stages of this reaction show a gathering of leucocytes, lymphocytes, plasma cells and polyblasts. The site of the tumor eventually becomes occupied by this granulation tissue. Later, epithelium grows over the surface, completing the repair. In large tumors necrosis may occur with liquefaction and cyst formation; in other instances the stroma may be replaced by fibrous tissue.

The gynecological conditions to which radium may be applied are: 1, carcinoma, 2, fibromyoma, 3, myopathic hemorrhages, 4, endocervicitis, 5, benign and malignant growths of the vulva, vagina and cervix.

CANCER.

Under this heading we can arbitrarily divide it into cancer of the cervix and cancer of the fundus of the uterus.

In cancer of the cervix we classify—1, operable, 2, borderline or doubtfully operative, 3, inoperable or hopeless, and 4, recurrences.

Cancer is operable when the disease is confined to the cervix without the formation of metastases. This is ascertained by vaginal and rectal examinations. From clinical observations upon the results of the Wertheim operation for a period of ten years, it is my opinion that surgery has no place in the treatment of this condition. This opinion, however, is not shared by other men who either do a hysterectomy and follow up with radium therapy, or as a preliminary treatment apply radium, then operate.

In the borderline or doubtful class there is some thickening of the broad ligaments, but a freely movable uterus. This thickening may be only inflammatory in character, therefore is deemed doubtful.

Cancer is inoperable when there is definite involvement of the parametrial structures and the lymph nodes of the pelvis. There may also be definite metastases in the lumbar lymph nodes or other portions of the body. Recurrences may occur at the site of the vaginal scar, or in the parametrial tissue, or lymphatic pelvic structures.

TREATMENT.

A preliminary statement should be made that all cases of uterine carcinoma are not fit subjects for radium therapy, any more than they are for surgery. When we consider that a large fungating cervical cancer with metastases is treated with radium, a tremendous amount of cell destruction takes place with the consequent absorption of the products of cell disintegration. It is, therefore, necessary to ascertain if the organs of elimination can take care of this extra strain placed upon them. It also becomes necessary—when seeing a prospective candidate for radium therapy—to make a thorough physical examination and give especial attention to the kidney function test, the urinary findings, the blood chemistry, the hemoglobin and red blood cell count. For instance, if a patient having an inoperable cancer, whose blood shows a hemoglobin of 30 to 40 per cent., a 2,000,000 red·cell count, and urine having marked albumin and casts with a phthalein output in two hours of 10 to 30 per cent. and a blood chemistry showing carbon dioxide combining power of 25 to 40 per cent. mg. to 100 cc. and a marked retention of urea nitrogen and creatinin, that patient is not a candidate for radium. Under these circumstances we transfuse with whole or citrated blood; then, when an interval of time elapses and improvement of the patient is marked, radium is applied. Arbitrarily, a patient showing a hemoglobin less than 50 per cent., or a red blood count under 3,000,000 is considered a poor radium risk. Also, when the phthalein output in two hours is less than 50 per cent., radium is not applied unless medical treatment improves the condition.

In applying radium to uterine cervical carcinoma it behooves us to consider that the lymphatic vessels draining this site are composed of two sets—one travels upward in the musculature of the uterus to the body that anastomoses with the lymphatics of the broad ligaments, and the other outward in the layers of the broad ligaments. In order to ray these areas we first insert a tube of fifty mg. into the fundus for twenty-four hours in order to destroy any cancer cells in the fundus. In a week's time another treatment is instituted in the midportion of the uterine body; and lastly, we apply radium to the cervical canal directly to the growth. At times, if the patient's condition allows, two tubes of fifty mg. of radium can be placed in the uterine cavity end to end, thus raying the whole fundus at one time. This treatment is repeated in six weeks and is continued over such a period of time as the condition of the patient, both locally and generally, warrants. The usual total dose considered necessary to effect arrest of growth is 7,200 mg. hours.

Cervical carcinomata that are of the fungating, sloughing type are often treated in combination with the foregoing by the introduction of needles containing twelve and a half mg. of radium, six of these needles being inserted and left for from six to twelve hours.

Fundal carcinomata are considered as good surgical cases if they have not metastasized, which they fortunately do late in the disease. Following operation, however, it is deemed advisable to ray them at intervals for at least six months.

RESULTS OF RADIUM TREATMENT OF CERVICAL CANCER.

In early operable carcinoma a cure may be accomplished. We have two cases that have remained one and a half to two years respectively without recurrence or metastasis, and are in good general health at the present time.

The inoperable cases can be markedly improved and their lives prolonged and made useful and comfortable. The bleeding can be stopped; the foul smelling vaginal discharge will cease, and the metastatic masses in the pelvis will become fibrotic and smaller. There may be a great alleviation of pain. As far as a cure is concerned, some cases appear arrested but later may have recurrences requiring more raying.

FIBROMYOMATA.

Fibromyomata of the uterus are generally considered best treated by myomectomy or hysterectomy. There are some patients, however, who, owing to cardiac or renal involvement, are poor surgical risks. In these instances radium is an ideal treatment. The method of application is to insert sixty mg. of radium into the uterine canal for twelve to twenty-four hours and crossfire with an application of fifty mg. from the abdominal side. These treatments are repeated every six to eight weeks. It is truly remarkable how rapidly these large tumors shrink, with relief, frequently following the first treatment, of the pressure symptoms upon bladder and rectum, and immediate cessation of uterine bleeding.

MYOPATHIC HEMORRHAGES.

Menorrhagia, especially seen at or near the menopause, is the most responsive to radium therapy of all the gynecological conditions. Here we have an overactivity of the internal secretion of the ovary manufactured probably in the graafian follicles. The introduction of sixty mg. of radium into the uterine cavity for twenty-four hours is sufficient to produce a complete cessation of the bleeding, and bring about an artificial menopause. Before the administration of radium a curettage should be done for diagnostic purposes.

ENDOCERVICITIS.

Chronic inflammations of the cervical canal producing a constant leucorrheal discharge have been treated with radium. Curtis of Chicago has reported excellent results with this therapeutic measure. At the Post-Graduate Hospital in the service of Dr. H. D. Furniss this was tried out in a series of cases; twenty-five mg. were inserted into the canal for three hours at a treatment, which was repeated in a week or ten days. This treatment, I am sorry to say, was most disappointing; our observations being that those cases in which it was of benefit could have been helped or cured by the usual methods of treatment.

BENIGN GROWTHS OF VULVA AND VAGINA.

Benign growths of the vulva and vagina, such as condyloma, fibroma and papilloma, respond most readily to radium. Similarly do other superficial conditions. Needles of seven and one half to twelve and one half mg. of radium are inserted to every centimetre of tumor tissue. This is supplemented by radium tubes—sixty mg. screened with brass and rubber—applied for an hour. These treatments are repeated if necessary at intervals of five to six weeks.

CONCLUSIONS.

1. Radium in the early cases of carcinoma of the cervix is considered by some to be the treatment of choice rather than surgery.
2. In the treatment of inoperable cancer and in the recurrences, the patient's life may be prolonged and made more comfortable by the elimination of local symptoms and the lessening of absorption of toxic products.
3. All patients with cancer desiring radium should first be tested for the kidney function and hemoglobin and red cell count if found low, or if the blood chemistry shows high nitrogenous retention, radium is contraindicated until their condition improves.
4. All patients with uterine hemorrhages at or near the menopause, not due to uterine fundal cancer, are readily cured by radium application.
5. Fibromyomata in patients whose general condition contraindicates an operation, can be treated by radium and good results expected.
6. The benign condition of the vulva and vagina shows excellent results following radium treatment.

47 WEST FIFTIETH STREET.

Two Complicated Deliveries Requiring Cæsarean Section*

By J. C. APPLEGATE, M. D., F. A. C. S.,
Philadelphia,
Professor of Obstetrics, Department of Medicine, Temple University, Obstetrician to the Samaritan and Garretson Hospitals.

The two patients whose condition I shall describe were distinctly hospital cases, though in labor in the home several hours, with little or no progress, before being referred to the hospital. One patient had a large uterine fibroid, the nature of the dystocia undetermined in the beginning; the other case was a breech presentation in a primipara with a pelvis below normal in dimensions and a fetal head oversize and greatly out of proportion to the pelvis.

Both were unusual cases and the course of procedure difficult to decide; in the first case as to whether it should be Cæsarean section or embryotomy, following an attempt at podalic version, and in the second a continuation of the breech delivery or section.

It occurs to me that the indications for section might be broadened somewhat, conservatively, for humanity's sake, and in effect to counteract a condition of affairs, statistically reported as follows: "The practice of obstetrics has improved and is improving in private practice," which is quite natural following the campaign on prenatal education, "but not so in hospital practice, where matters are growing worse, especially in infantile mortality." If such statistics can be verified, and I have no doubt that they can, there can be but one conclusion, viz., that the hospital is too often the dumping ground for patients beyond the stage of recovery, or else there has not been due regard to the necessity for asepsis and antisepsis in the manipulations before the patients are admitted to the hospitals for treatment. In other words, they are infected before they reach the hospital.

The foregoing statements do not apply to the Samaritan Hospital. While I have not the data at hand, I am sure the mortality there has steadily decreased. The physicians referring cases, as a rule, are careful as to cleanliness—asepsis and antisepsis—and rarely, can it be said, is the hospital used as a dumping ground for patients beyond the stage of recovery. By far the largest percentage of the few infections and deaths—maternal and fetal—occurs among those who have received no attention at the dispensary or elsewhere, or have been attended by midwives.

The mortality in elective Cæsarean section under modern surgical technic is practically nil. The operation involves the opening of the abdominal cavity, however, which is always accompanied by some risk, hence the indications should be positive and definite or else the woman is entitled to the benefit of the test of labor. What is true of elective section, is also true of emergency section providing due regard is paid to cleanliness, asepsis and antisepsis, or else the hands off method, when in doubt, until convinced that she is not a patient for section. The maternal morbidity and infant mortality may be still further reduced by broadening, conservatively, the indications in this field.

For example, the time was when we would hesitate to do section after the membranes had ruptured; after the patient had been examined or manipulated; after attempts at forceps delivery or podalic version, or after the induction of labor that failed, when the presenting part did not engage under the influence of contractions, by reason of dystocia. The floating head in itself is not an indication for section, but the floating head because of disproportion or other forms of dystocia is an indication. Breech presentation in a primipara with a large fetal head, or moderate disproportion, whether due to the abnormal head or pelvis or both, demands section in the interest of both mother and child.

The hazard in operating under such circumstances is not underestimated when one is without the full knowledge that they have not been previously infected. The first case that I shall report had a protruding hand and arm for a time but they were kept clean and there was no infection. Our results here, in emergency sections have been uniformly good, with living children, and in two of the cases which I present herewith under any other method the infants would have been stillborn and mutilated and the mothers greatly traumatized.

Case I.—Mrs. M., aged thirty-two, primipara, with negative family and personal history, never ill, except for the usual diseases of childhood and her previous normal labor and puerperium, eight years previously. She was referred to the hospital by a hospital doctor, without manipulations in the home, who recognized an abnormal condition, also the need for hospital treatment. She was admitted March 28th, after having been in labor two or three hours; the membranes had ruptured before she reached the hospital.

The external examination showed a large pendulous abdomen with a large mass in the left lower quadrant, not unlike a fetal head. The fetus could be outlined but no fetal heart sound could be heard. The pelvic dimensions were normal. By vaginal examination the cervix was found to be fairly well dilated and the head presenting at the inlet but could not be made to engage. Usually uterine fibroids above the inlet would permit of delivery by the natural route but this involved the lower uterine segment and made impossible sufficient dilation for head first extraction or podalic version.

Version was abandoned after several attempts on account of beginning exhaustion of the patient, fatigue of the doctor and threatening rupture of the uterus. Each time a fetal member could be reached it proved to be a hand instead of a foot. A hand protruded through the vulval orifice. This was cleansed and replaced. There remained the choice between embryotomy and Cæsarean section. The partial obstruction from the tumor with rigidity of

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* Read before the Samaritan Hospital Medical Society, Philadelphia, January 9, 1922.

the lower uterine segment, together with the possibility of resuscitating the baby, for there appeared to be slight pulsation in the umbilical cord, decided the course of procedure in favor of section, which was performed two hours later, that is, as soon as the patient had recuperated under stimulation.

The medium high incision was made, under ether anesthesia, and after the extraction of the child the uterus with tumor was removed by hysterectomy. The weight of the baby was slightly under eleven pounds (ten pounds and fourteen ounces). The tumor weighed a little less than eight pounds (seven pounds and fifteen ounces). The incision was closed in the usual way, with cigarette drain in the lower angle of the incision as a precautionary measure, and removed on the second day. The wound healed promptly. The patient had no rise in temperature and she left the hospital on the fourteenth day.

One of the noticeable features in connection with this patient was the unusually rapid growth of the fibroid tumor of the uterus by reason of the free blood supply during pregnancy. She had no metrorrhagia nor menorrhagia prior to pregnancy nor anything during gestation to indicate that the tumor existed until she was in labor and operated upon.

CASE II.—Mrs. H., aged twenty-two, primipara, with negative family and personal history. She had had the usual diseases of childhood, but otherwise had always enjoyed good health. This patient was due to have been delivered about November 14, 1921. She was admitted to the hospital November 20, 1921, having been in labor about fourteen hours and in active labor four hours. The physicians in attendance diagnosed the breech presentation with a large fetal head and wisely concluded that her place was in the hospital and that the method of delivery should be by Cæsarean section. During the trip from her home to the hospital in the ambulance there was some progress. The pains and contractions, when we first saw her, occurred every three minutes with buttocks presenting at the outlet during each contraction.

Her pelvic dimensions were practically normal; interspinous, twenty-six cm.; intercristal, twenty-eight cm.; transverse, thirty-two cm., and external conjugate, nineteen and five tenths cm. The fetal head was apparently considerably oversize, and subsequently all of the diameters measured two cm. above normal. Undoubtedly this woman could have delivered the body of the child spontaneously or with little assistance by the natural route, after her trip in the ambulance, but it was clearly evident that the aftercoming head could not be extracted without a great deal of maternal traumatism and the destruction of the life of the child. Section was performed under ether anesthesia through the medium high incision. The lower extremities and buttocks were in the vagina, outside of the uterine cavity, and it was necessary to apply forceps to the head in the cavity of the uterus for delivery through the incision. This might be termed reverse forceps delivery. The fetal heart sounds were indistinct prior to operation, but the child was resuscitated without great difficulty, by suspension in midair by the feet, a spanking, and a few drops of ether on the chest.

The head measurements were: Occipitofrontal, thirteen and five tenths cm.; occipitomental, fifteen and five tenths cm.; suboccipital bregmatic, eleven and five tenths cm. (all two cm. above normal). The weight of the child was eight pounds and thirteen and a half ounces.

The incision was closed by layers, peritoneum, muscles, fascia and skin with continuous chromic No. 1 catgut sutures. Primary union followed with uninterrupted convalescence and the patient left the hospital on the sixteenth day after operation. In this patient there developed a slight sapremic temperature between the fourth and seventh days—never over 100°—accompanied by a vaginal discharge with some odor, due to retention of small portions of membrane, which had ruptured prematurely, by the way, as in the former case.

This was my first and only experience in delivering a child with forceps through the incision after being partly born by the natural route, but knowing the carefulness on the part of the doctors in attendance I concurred in their opinion and feel that the results justified the course of procedure. In no other way could this child have been born alive.

3540 NORTH BROAD STREET.

Once a Cæsarean Always a Cæsarean*

By EDMUND B. PIPER, M.D., F.A.C.S.,
Philadelphia.

Like most epigrammatic phrases used in writings on medical subjects, the heading of this article does not cover the question. The pendulum has swung backwards and forwards in regard to the truth or fallacy of the statement that "Once a Cæsarean always a Cæsarean" so much, that I do not believe at present it would be possible to get any large number of obstetricians to agree on the subject.

The first recorded Cæsarean section upon a living person was done by Trautmann in Wittenberg in 1610. The patient lived twenty-five days. However, the operation is in all probability a much older one. Until quite recently the mortality was so extremely high that the operation was avoided at any cost. Hirst believes that the mortality at present, in the hands of skillful operators and under favorable conditions, should be below one per cent. DeLee says one per cent. to two per cent. Edgar thinks that in the operation under good surroundings the maternal mortality should be almost nil. Cragin gives his mortality as 6.66 in 150 cases; in 143 nontoxic cases his mortality was 2.09.

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* Delivered before the John Morgan Society, Philadelphia, December 2, 1921.

The statistics given above ranging from one per cent. to two per cent. refer only to that type of case which we speak of as elective Cæsarean section. The mortality in emergency Cæsarean section is unquestionably a great deal higher. In a series of thirty-seven cases, all of which were emergency cases, my mortality was ten and eight tenths per cent.

Until recently the only indication for Cæsarean section was disproportion between the fetal body and the maternal birth canal. We now believe that there are many other possible indications, but we do not believe in the three indications accredited to one obstetrician, that is, 1, the patient must be a woman; 2, the patient must be pregnant; 3, the patient must be unable to speak English.

In spite of the low mortality asserted for the elective Cæsarean, we do not believe that it ever will be anything but a serious major abdominal operation, and we believe that it never should be resorted to except in those cases in which it gives the mother a better chance for life and future health than a delivery by the normal vaginal route. There are very few absolute indications for Cæsarean section. Pelvic measurements *per se* must be only looked on as comparative. A woman with a somewhat contracted pelvis will give birth to a small child as easily as one with a normal pelvis will deliver a large baby. Every case of placenta prævia should not necessarily be delivered by a Cæsarean section. A few of the indications for Cæsarean section may be given as follows:

1. A definite disproportion between the fetal presenting part and the maternal pelvis.
2. Central placenta prævia with no dilatation or effacement of the cervix.
3. Marginal placenta prævia where there has been hemorrhage with a not easily dilatable cervix.
4. Premature separation of a normally placed placenta with an undilated and not easily dilatable cervix.
5. Eclampsia where the convulsions are increasing in severity and when elimination has been tried and there is no evidence of labor. In other words, where the uterus can not be easily evacuated by the vaginal route.
6. In some cases of the toxemia of late pregnancy, in which active treatment seems to be of no value, and a long, tedious labor is anticipated, which probably will terminate in eclampsia.
7. In some cases of cardiac decompensation.
8. In some cases of pulmonary tuberculosis.
9. In some cases of prolapsed cord.
10. Face presentation with chin posterior, and in some impacted shoulder presentations.

Every case in which the question of delivery by Cæsarean section is considered must be looked upon as a law unto itself. I do not believe that we can unequivocally say that any case under a given condition must be Cæsareanized. The whole question resolves itself into what is best for the individual case under consideration. At present it is considered safer for the patient, both as to her immediate recovery and subsequent health, that she should be delivered by Cæsarean section rather than the use of axis traction forceps upon a high floating head. It is unquestionably so for the child. The injuries to the various parts of the birth canal, following a high forceps operation, are unquestionably the cause of invalidism occurring in the later life of many women.

It must be understood that I am speaking only of the classical Cæsarean section. I am not considering the Porro or the various types of socalled extraperitoneal section, or the vaginal Cæsarean section, which latter is a misnomer and should always be termed anterior vaginal hysterotomy.

The chief contraindication to the promiscuous use of Cæsarean section is the danger of the rupture of the uterine scar in a subsequent labor. Davis, of Philadelphia, in his discussion before the American College of Surgeons this year, said it was generally conceded that in four per cent. of cases the uterine scar was ruptured in a subsequent labor. Hirst has the record of but one case that he knows of, of a ruptured uterine scar in a subsequent labor in approximately five hundred cases of Cæsarean section done by himself. I have seen two cases within the past six months which seem to have a peculiar interest in this problem.

Case I.—I delivered this patient by Cæsarean section two years ago, the indication being obstructed labor. There was a stormy puerperium with signs of local peritonitis. On or about ten days after operation, the patient passed from the vagina a long mass of tissue, the length of the uterine scar, with the deep layer of continuous catgut stitch unabsorbed. The patient made a final recovery and I warned her that she was never to allow herself to fall in labor as she would undoubtedly rupture her uterus. Some months ago she presented herself to the outpatient department and was given the usual prenatal care and ordered to come to the hospital two weeks before term. This she failed to do and was admitted sometime later in active labor with signs of shock and internal hemorrhage. She was operated upon and the uterine scar had ruptured completely. Hysterectomy was done and the patient eventually recovered.

Case II.—The patient had been previously delivered three years before in Boston. I was asked to take charge of her by her family physician, who showed me a letter from her doctor in Boston stating that in his judgment the woman should be delivered by Cæsarean section and that the indication for the previous Cæsarean was toxemia of pregnancy and a faulty pelvic inclination. My examination two months before term disclosed no pelvic contraction and there were no symptoms of toxemia. The patient had a slight goitre. It was determined to give this patient a test of labor. Later on the doctor in charge of the case, which was in a city at some little distance, notified me by telephone that the head had not come in the pelvis. Before we could arrange for an elective section the patient was in labor. With the membranes unruptured she was given morphine until I could arrive. Examination gave every indication that labor could be successfully terminated by the vaginal route so the patient was allowed four hours of sharp labor. At the end of that time, as she had made no progress, I became fearful of the uterine scar and opened her abdomen. We delivered a living child and found the scar of the previous Cæsarean had thinned out until it was less than a half inch thick. One of the indications in this case that decided us to do section was a high abdominal incision, which made us suspect that there had been a high uterine incision, and this proved to be the case. A few more hours of hard labor would in all likelihood have caused a rupture of the uterus.

I have seen other cases of rupture of the scar of a previous Cæsarean operation, but the two cases cited are the only ones of which I have an intimate, personal knowledge. It would seem that any statistics on this subject must of necessity be rather inaccurate, as in order to give real statistics of rupture in a subsequent labor in a hundred cases, we must know that each of these patients is delivered by the vaginal route if they became pregnant at all, and in many cases, similar to Case I, cited above, it would unquestionably be the worst kind of obstetrics to allow the patient to fall into labor at all.

The question of repeating a Cæsarean section, I believe, depends upon two things: namely, the indication for the first section and the character of the patient's postoperative convalescence, following the first operation. Taking a hypothetical case for an example, if I were called to attend a woman in confinement, and she gave a history of having had two children normally, and in her third pregnancy she was delivered by section on account of central placenta prævia, following which she had an uneventful, afebrile convalescence, I should certainly allow her a test of labor under careful observation. If, on the other hand, a woman were delivered of her first child by Cæsarean section on account of a definitely contracted pelvis, I should doubt the advisability of allowing her to fall in labor in any other of her subsequent pregnancies, unless she should accidentally fall in labor at least four weeks before term, when she might be allowed a moderate test of labor.

This problem is one which is open to a difference of opinion, and one should not be too didactic in the matter, but I believe that any woman that has been delivered twice by Cæsarean section should never be delivered in any other way. This statement naturally brings up the question of how many times this operation may be done on any one woman. Davis, of New York, has delivered one woman six times and Hirst, of Philadelphia, has delivered one four times by Cæsarean section. It would seem that any woman that had undergone four abdominal operations to give birth to children has done her fair share along that line, and that she should be sterilized, if she expresses such a wish.

CONCLUSIONS.

1. A Cæsarean section at all times is a serious major operation.

2. The indications for a first Cæsarean section is the most important factor in determining whether it should be repeated in the next parturition.

3. A stormy puerperium is a contraindication to a normal vaginal delivery at the next confinement.

4. The advisability of elective Cæsarean section should always be carefully considered in any subsequent pregnancy.

5. Once a Cæsarean, almost always a Cæsarean.

1936 SPRUCE STREET.

A Brief Résumé of Some of the Recent Advances in Gynecology

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That intelligent treatment is predicated upon exact diagnosis is axiomatic. Yet it is astonishing to discover how many practitioners who essay the treatment of gynecological patients have failed, and possibly still fail, to determine the real cause of symptoms referable to the urinary tract. It is not necessary that the gynecologist become a urologist, nor do I advocate that the former trespass upon the field of the latter, but I do contend that the bladder is a pelvic organ and that gynecology properly embraces the diagnosis and treatment of all diseases of the pelvic organs in the female. The cystoscope is a diagnostic instrument of precision and no gynecologist is qualified to practise his specialty until he has acquired a working knowledge of cystoscopy. There is no longer any excuse for attributing various urinary symptoms in women to cystitis, washing out the bladder, and prescribing urinary antiseptics, when the cause of the symptoms may be anything from an ordinary trigonitis to a neoplasm or urogenital tuberculosis. That gynecologists themselves have come more and more to appreciate these facts constitutes one of the recent advances in gynecological practice.

Derangements of the ductless glands comprise a large proportion of the problems confronting the gynecologist, and to a certain extent he has participated in the study and development of endocrinology. I believe that much of the difficulty experienced by some general practitioners in understanding this complex subject is due in part to the failure on the part of those who publish articles on its various phases to discriminate between accepted facts and pure theories. Endocrine therapy is still in its infancy, but despite the lack of standardization of several organotherapeutic agents, properly selected cases have already been materially benefited by it. The disturbances in each individual, however, must be correctly analyzed, otherwise one cannot tell which remedial agents are indicated. Thymus and mammary extracts in socalled cases of idiopathic uterine hemorrhage; thyroid extract in hypothyroidism; whole ovarian extract or ovarian residue in amenorrhea and the menopause; pituitary extract in dystrophia adiposogenitalis; and corpus luteum extract in the hyperemesis of pregnancy, vicarious menstruation, and habitual abortion, have all proved efficient in certain instances. It is particularly fortunate that all the gynecologist's patients

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are women, as the character and behavior of menstruation, together with the existence of premenstrual phenomena, often serve as the signal system of the ductless glands. I have been encouraged by past experiences and am enthusiastic as to the future of organotherapy, but at the same time realize its present limitations.

One very definite contribution to our gynecological equipment has been made within the past few months by Dr. I. C. Rubin. He has devised a nonoperative method of determining the patency of the Fallopian tubes, by means of intrauterine inflation with carbon dioxide and the production of an artificitl pneumoperitoneum. A knowledge of the patency of the tubes is of the utmost importance in the diagnosis and therapy of sterility in the female, and the desirability of such a method whereby this can be demonstrated is selfevident. Only small amounts of gas are necessary and the details can be carried out in the office. The technic is relatively simple, and by connecting a manometer to the gas circuit and carefully regulating the flow of bubbles, the operator has complete control of the situation. In the positive patent cases, gas will enter the peritoneal cavity under a pressure of from 40 to 100 mm. When the pressure reaches 150 mm. or more, the closure or stenosis of the lumen of the tubes may be presumed. This test is of course contraindicated in the presence of active pyogenic pelvic infections.

Pneumoperitoneum itself, as originally introduced by Stein and Stewart, has a distinct field of usefulness in gynecological diagnosis. By this means intraabdominal organs can be visualized on x ray plates to an extent heretofore impossible.

To anyone assuming the responsibility for human life, there can be no matter of greater concern than the predetermination of the vital resistance, before subjecting a patient to anesthesia and operation. This implies an estimation of the patient's metabolic capabilities and abnormalities, in addition to the existing pathological conditions. While we are largely indebted to the laboratory worker and internist for the several recently developed and available procedures for making such a preliminary survey, the gynecologist has promptly recognized their significance. Renal function tests, studies in blood chemistry, particularly of the urea nitrogen and blood sugar, the carbon dioxide combining power of the blood, and basal metabolism, are all comparatively easily applied methods by which these factors can be ascertained, and are now in daily use.

Notwithstanding the futility of attempting an exposition of the gynecological aspects of the cancer problem, some reference must be made to the use of radium in the treatment of uterine cancer and fibroids. The application of radium needles, which may be thrust into the tumor mass or adjacent tissues, standardized dosage, and improved technic, have done much to enhance the efficiency of radium applications. Acknowledging that the morbidity of cancer has not decreased, that its causative factors remain obscure, and that no cure for this dread disease has been discovered, it must be admitted that radium therapy is a valuable addition to our armamentarium. The misuse of radium has lent false encouragement and reflected discredit upon it, but those experienced in its use are beginning to appreciate what may be expected of it and what its limitations are. We have learned that a preliminary study of the patient's metabolic activities and powers of elimination is as essential before radium treatment as before operation, so that the effect of the toxemia and increase in nitrogenous elements following the extensive cell destruction may be anticipated. The dosage is then regulated accordingly, and ofttimes preceded by a blood transfusion.

Statistics are notoriously unreliable, and I have little confidence in them. What are we to think when some maintain that surgery no longer has any place in the treatment of cancer of the cervix, and rely upon the use of radium alone (Clark, Mayo), while others state that "it is absolutely certain that radium and cautery cannot cure cancer of the cervix" (Cobb, Peterson), and each faction compiles apparently convincing figures to prove their assertions? The majority of gynecologists are probably not in accord with either of these extreme views. and utilize both radium and surgery at various times. Most of us believe that patients in whom surgery is contemplated are distinctly benefited by an anteoperative radium application, as this blocks the lymphatics and inhibits the dissemination of cancer cells. We are also fairly well in accord that surgery is indicated in cases of fundal carcinoma, because metastatic involvement of lymph nodes occurs late in the disease. Most of the dissension exists in regard to early cases of cervical carcinoma.

When radium is used, it should be applied by raying the fundus first, the midportion a week later, and the cervix last, unless the patient's general condition will tolerate an application to the entire cavity at one time, by inserting the radium tubes in tandem. Radium bromide is used in tubes of fifty mgm., and screened by one and five tenths mm. of brass and soft rubber. The more advanced cases are nearly all treated with radium, paying due attention to the patient's vital resistance. Pronounced anemia, impaired renal function, or abnormal retention of nitrogenous excrementitious products, are contraindications for vigorous radium therapy until these derangements have been corrected. To sum up the situation, I submit that each one of us should exercise his judgment in accordance with the merits of each individual case, his own impressions, and his past experience, with a due regard for the opinions of other workers and the results obtained by them.

Radium therapy is an ideal method of treatment for uterine fibroids in patients in whom operative measures are contraindicated by cardiac lesions, nephritis, or metabolic disturbances. It is also of service in cases of fibroids of moderate size, when sterilization of the patient is of no consequence. Bleeding stops promptly and the tumor diminishes rapidly in size. Large tumors, tumors in young women, and tumors causing pressure symptoms, however, should be operated upon.

These cursory allusions to some of the current gynecological problems are made chiefly to suggest topics for discussion, rather than to attempt deliberately to condense a mass of material in a few words.

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Carcinoma of the Cervix Uteri in the Nulliparous Woman*

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The question of carcinoma uteri of the nulliparous woman is replete with interest and much of value can be learned from the nine cases herewith reported for the first time. It still remains true that practically nothing is known of the specific cause of carcinoma. Of the many theories that have been advanced, none has been proved. The following statements frequently are seen in the textbooks and the literature: Cancer of the cervix is rarely found in women who have not been pregnant; or, upon whom some operation upon the cervix has not been performed; lower classes are more susceptible than the higher; more frequent among the white than the colored women; the traumatism of coition is a factor to be considered; invariably a history may be obtained of a miscarriage, or possibly the expulsion of a fibroid tumor. Cases have been cited illustrative of these etiological factors.

Of the nine cases herewith reported (five patients were seen during the past year), five were married (one of whom (Case VI) became pregnant, associated with the malignancy); of the unmarried, in two the hymen was intact, in another the hymen was ruptured and patient admitted coition having taken place, while in the other the hymen was ruptured, but patient denied coition having taken place. Eight are white women and one colored. The ages are twenty-nine, thirty-four, thirty-six, thirty-nine, forty-nine, fifty (two), fifty-five and sixty. It is of interest to note that the first two patients were seen within a period of one month; and four of the last five cases during a period of four months. Five of the patients coming under observation during the past eleven months.

In none was there obtainable a history of 1, a miscarriage; 2, any operations upon the cervix, except in Case VIII; 3, nor the expulsion of a fibroid tumor. In other words, in five of the cases, the only possible source of trauma was coition; in two the hymen was intact, and in no way can trauma be considered an etiological factor.

Dr. Thomas Addis Emmet first observed the relatively frequent development of cancer upon the lacerated cervix, and the almost total absence of it from the nulliparous cervix. Howard A. Kelly (1) states that he has seen but three cases of cervical cancer in nulliparæ, and, in one of these, the cervix had been forcibly dilated. Kelly refers to the statement that Emmet told him, that the only case of cancer of the cervix he had seen in a nullipara, also was one where forcible dilatation had been practised. Kelly further states (1) "In advance of the local examination the fact that the patient is a nullipara is always strong presumptive proof against cancer of the cervix uteri." In regard to this latter statement, in view of the cases herewith reported, and others recorded from time to time, the examiner must not be influenced by the age or social status of the woman; when making a pelvic examination, the patient must be approached with the firm determination of making a positive diagnosis. It is only in this way that the early diagnosis of cancer of the uterus more frequently will be made.

The Middlesex Hospital, England, published a series of cases of cancer uteri, showing that six per cent. of the cases occurred in sterile women. Possibly it would be safe to say that about three to four per cent. of the cases of carcinoma uteri occur in nulliparous women.

REPORT OF CASES.

CASE I.—F. W., white, aged forty-nine, married, housewife, first seen on May 28, 1919. Six months previously she had consulted her physician, an excellent internist, for occasional vaginal bleeding. A vaginal examination was made and her physician said to her, "You have a small lump on the neck of the womb; if you have any further trouble, come and see me; as you have not had any children, I do not think it is of such a nature that you need feel alarmed." The manner in which the matter thus was dismissed completely misled the patient and her husband, and accordingly, little or no further thought was given to the occasional bleeding throughout the following five months. During the sixth month, in addition to the occasional blood spotting, bleeding was noticed on coition, and the husband brought her to my office to ascertain the cause. There was found a peculiar socalled pushing out of the posterior portion of the cervix, more marked at the middle third, which was hard, and the examining fingers were blood smeared. The blood came out of the cervical canal. There was no erosion of the cervix; uterus freely movable, and no palpable infiltration in either broad ligament, or anteriorly or posteriorly. A clinical diagnosis was made of carcinoma of the cervix and the situation fully explained to the husband. The attending physician was duly advised of the findings, and requested an examination by another gynecologist, which was made, and diagnosis confirmed. The microscopic examination showed adenocarcinoma. Upon conference, it finally was agreed that a high amputation of the cervix be done and radium treatment be given. The patient was admitted to the Samaritan Hospital, June 6, 1919, and a high amputation of the cervix was done. As we did not have radium at that time, she was referred to another hospital for subsequent radium treatment, which proved ineffectual, death occurring in less than a year.

CASE II.—M. B., white, aged fifty, single, cook, referred to me by her physician on June 13, 1919. For four years before she had had general abdominal distress, more marked in lower abdomen, and during the past several months, had had a constant vaginal bleeding, as a result of which she was unable to continue her occupation. An odor at times accompanied the expulsion of blood clots. The hymen was intact, and it was not possible to make a vaginal examination. Upon rectoabdominal examination, it easily was possible to palpate a cauliflower growth, completely filling the vault of the vagina; with infiltration filling the pelvis to a greater extent. The uterus, obviously, was fixed. A diagnosis of advanced carcinoma of the cervix uteri was made, and operation advised and accepted. On July 26, 1919, the patient was admitted to the Samaritan Hospital, and submitted to a Percy cautery operation. Both ovarian and both internal iliac arteries were ligated. In order to introduce the water jacket vaginal speculum, it was necessary to incise the pelvic floor down to the rectum. Microscopic examination showed squamous cell carcinoma. The patient was discharged from the hospital August 13, 1919, with the vaginal bleeding controlled and pain ameliorated. During the following months, her general condition showed no improvement, but rather a gradual exhaustion and she passed out of my observation.

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Much to my surprise, on November 11, 1920, she walked into my office. During the previous six months, she had been working steadily, but on account of increasing hemorrhages, requested further treatment. At this time, the cervix was noted completely to have disappeared. There was no crater. The amount of pelvic infiltration appeared to be about the same as at previous operation. Upon introducing the finger into the uterine canal, necrotic tissue easily was broken down, accompanied by marked bleeding. There was no odor. Through the courtesy of Dr. Wilmer Krusen, the patient was admitted to the gynecological ward, November 12, 1920, and radium inserted. One week subsequently there was no bleeding nor vaginal discharge. On December 11, 1920, the patient again was admitted to the gynecological ward, for a second radium treatment. At this time the pelvic mass appreciably was smaller, but easily bled on palpation. The patient stated that for the previous three weeks she had been free from all pain and vaginal discharge. On January 3, 1921, the patient still was free of pain and vaginal discharge, and had gained twelve pounds in weight since her first radium treatment. No bleeding was provoked on vaginal examination. I have not been able to locate her since that time.

Case III.—E. R., white, aged fifty, married, came to the office February 8, 1921, after having been married three months, to ascertain the cause of bleeding on coition and on using a douche. She was menstruating regularly. An eroded area was palpated on the left cervix, which bled easily, and there was infiltration into the left broad ligament, which fixed the uterus. There was no palpable infiltration into the right broad ligament, nor anteriorly nor posteriorly. A diagnosis of malignancy was made, and the husband so informed. Microscopic examination showed adenocarcinoma. Three radium treatments were given a month apart. The last opportunity I had to examine this patient was in May, 1921. At that time, the bleeding on coition had disappeared, the eroded cervix had entirely healed, but there was no palpable difference in the infiltration in the left broad ligament. This patient has passed out of observation. However, I recently saw her on the street, and her general appearance had greatly improved.

Case IV.—A. W., aged thirty-nine, white, single, mill worker. Referred to my office, September 1, 1921. For the previous six months she had been under the care of two physicians for continuous vaginal bleeding, which had persisted for seven months. The first physician did not make a diagnosis, prescribed drugs only, and as no relief was obtained after a few months, she consulted a second physician. The second physician told her that she had an ulcerated womb, and, in addition to prescribing drugs, was supposed to have given local treatment. Not obtaining relief, she consulted a third physician, who, after taking her history, referred her to me for an opinion. It was not possible to introduce the index finger into the vagina, on account of an intact hymen. The little finger could be introduced, and met with an obstruction in the vagina. On rectoabdominal examination, a cauliflower mass was palpated, easily filling the vault of the vagina. It was recommended that she be sent to the hospital, and further studied under an anesthetic, carrying out at that time the treatment that would be indicated. Through the courtesy of Dr. Wilmer Krusen, she was admitted to the gynecological ward, September 3, 1921. Under anesthesia, the vaginal examination was completed, and a cauliflower mass which could be rotated was found completely filling the vault of the vagina. With difficulty a finger was passed over the mass which was found to be attached by a transverse pedicle to the superior border of the anterior lip of the cervix. This is the only case in which I have seen a pedunculated cauliflower growth of cervix. The mass easily was detached, but no extension could be palpated in pelvis, or anteriorly or posteriorly. Radium was inserted into uterus and cervix. Microscopic examination showed squamous cell carcinoma. On October 2, 1921, she was readmitted to the ward for a second radium treatment. At this time the cervix on palpation and inspection was that of a normal cervix, and the pelvis appeared to be normal in all respects. The patient was free of all vaginal discharge and bleeding. A normal menstrual period occurred during the four days previous to second admission. On November 10, 1921, she was readmitted to ward for a third radium treatment. Cervical and pelvic findings were apparently normal in all respects. On December 17, 1921, the patient was examined again. The cervical and pelvic findings to all appearance were normal. There has been no further bleeding nor menstruation and the patient has returned to her occupation.

Case V.—L. T., colored, married, aged thirty-four, housewife. Consulted her physician on account of bleeding on coition and metrorrhagia. The physician was suspicious of malignancy and referred her for diagnosis and treatment on October 19, 1921. There was a cauliflower growth of the cervix, completely filling the vault of the vagina, which bled freely on palpation. There was extension into both broad ligaments. A diagnosis of advanced carcinoma was made and radium advised. Through the courtesy of Dr. Wilmer Krusen this patient was admitted to the gynecological ward and radium inserted October 29, 1921. Microscopic examination showed squamous cell carcinoma. On November 31, 1921, the patient was readmitted for a second radium treatment. The uterus was still movable and infiltration in both broad ligaments about the same as on previous admission. The large cauliflower mass had disappeared, the cervix was still enlarged, edges sharp and everted. Since the first radium treatment, there has been only an occasional bloody show. This patient should have returned the end of December for her third radium treatment, but has postponed her return for personal reasons. (On the next day after this paper was read the patient was readmitted to the hospital for her third radium treatment. The cervix had appreciably decreased in size and the surface of the cervix had, apparently, healed. There was no bleeding; the uterus was freely movable and no palpable infiltration into the broad ligaments was determined.)

CASE VI.—B. S., white, aged twenty-nine, married, housewife. Seen with her physician November 20, 1921. About six months previously the patient first consulted her physician on account of bleeding on coition, and to ascertain the cause of her sterility. She had been married several months and was extremely anxious to become pregnant. On examination, her physician found an anteflexion of the uterus, the tubes and ovaries were negative, and an erosion of the cervix at the external os. Applications were made of nitrate of silver, appropriate douches ordered and at the end of two months the erosion on the anterior lip had entirely healed, but the posterior lip only partially. In the interim, the patient missed her menstrual period. The local treatment was continued, but the posterior lip showed no disposition to heal and later her physician noticed a thickening of the posterior lip, and becoming suspicious of a possible malignancy, requested me to see patient with him. On examination the patient was found to be about four and a half months pregnant; there was a pushing out of the posterior lip throughout its entire lower portion, which was very hard. A clinical diagnosis of cancer of the cervix was made. There was no palpable infiltration in broad ligaments on either side. As the malignant process antedated the pregnancy, this case is included in this series as one of carcinoma of the cervix in a nulliparous woman.

This patient presented an unusually interesting problem. She was extremely anxious to have a child and was a Catholic. Both she and her husband were told of the exact findings, and the teaching of her church were discussed. The question of hysterectomy versus radium was laid before them. They finally agreed to waive the church views, if necessary, and it was decided to have her admitted to the hospital, and, under anesthesia, remove a piece of tissue for immediate microscopic examination, make a most thorough examination of the pelvis and then decide what course to pursue. However, within a few days, through relatives, she consulted a Catholic gynecologist, who used radium the latter part of November and early part of December and who states 1, that the cervix showed marked improvement; 2, that the patient did not abort, and 3, that the microscopic report was adenocarinoma. This case presented, as you readily can realize, some interesting features. It is the second patient I have seen with carcinoma of the cervix associated with pregnancy. (Since reading this paper, I have been advised by the gynecologist herein referred to that the patient aborted January 8, 1922; there was a blighted ovum, and he is of the opinion that death of the fetus was attributed directly to the radium.

May I digress for a moment. Cancer complicating pregnancy and labor is of such rarity and the calamity of such a complication is so grave that it excites the deepest interest and attention. De Lee (2) states in 19,400 consecutive obstetrical cases at the Chicago Lying-In Hospital and Dispensary, only one was associated with cancer of the cervix. Howard A. Kelly (1) reports twenty-two cases in a series of 41,900 cases of labor from three European maternities, a percentage of 0.047. After a careful review of the literature, one is inclined to the belief that the consensus of opinion is, that if carcinoma of the cervix uteri associated with pregnancy is discovered before the fourth month of pregnancy, a radical operation should be advised, after the true state of affairs has been made known to the patient and her family. If discovered after the fourth month, the pregnancy should be permitted to continue until viability, then an abdominal or vaginal Cæsarean section done, followed by panhysterectomy. That the induction of abortion or miscarriage as a palliative measure is not permissible. Radium has its advocates. Botta and de Bengoa (3) report the case of a pregnant woman with cancer of the cervix uteri, which was allowed to go to term; they saw her at the fifth month of pregnancy and instituted radium treatment. This case, apparently, demonstrated that at least after the fifth month of pregnancy, the fetus does not suffer from radium exposure. A panhysterectomy was done on this patient after Cæsarean section. These observers advise that the rochar method of treatment should be followed in such cases; the term rochar is made up from the initials of the procedures applied: radium, observation, Cæsarean section, hysterectomy, annexectomy, radiation.

CASE VII.—L. S. C., aged fifty-five, white, clerk. This is a patient of Dr. D. J. Donnelly, through whose courtesy I have the privilege of making the report. I had the opportunity of seeing this patient at the time of her radium treatment. This patient was first seen by Dr. Donnelly, December 9, 1921, and gave the following history. Menopause nine years ago. Six months previously first noticed a watery, vaginal discharge, which gradually increased in quantity and consistency. After about four to five months, it became offensive. About a month ago, first noticed spot of blood. The day previous to consulting Dr. Donnelly, the patient had a marked hemorrhage from the vagina while on the toilet. The general appearance of patient was good. Upon examination, there was found an excavated, enlarged, hardened cervix, with infiltration into both broad ligaments, and the uterus fixed. A diagnosis was made of advanced carcinoma of the cervix uteri. The patient was admitted to Samaritan Hospital and radium treatment given December 15, 1921. Microscopic examination showed adenocarcinoma. Dr. Donnelly again examined this patient January 6, 1922. The vaginal discharge and bleeding have ceased, there was no odor to the vagina, and no appreciable difference in the pelvic findings.

Case VIII.—(This patient was seen since this paper was read.)—F. G., white, married, aged thirty-six. Had never been pregnant. Five years ago had a dilatation and curettage for sterility. At that time, the physician who performed the operation told her that he had lacerated the cervix. There was an inoperable adenocarcinoma of the cervix. This patient had been under the care of several physicians, and radium had been used. The hemorrhage continued. The interesting points in this case are: 1. Would the carcinoma of the cervix have developed if the cervix had been repaired immediately? 2. The rapidity with which malignancy developed after the stated time of traumatism.

Case IX.—(This patient was also seen since this paper was read.)—S. W., white, single. aged sixty, admitted to the Samaritan Hospital, February 14, 1922, service of Dr. Wilmer Krusen, to whom I am indebted for the privilege of reporting the case, and with whom I had the opportunity of seeing the patient. The object of admission to the hospital was for radium treatment. About six months ago vaginal bleeding was first noticed, which continued more or less profusely. The patient concealed her condition until a few weeks ago. She denied coition. There was no history of an operation. The hymen was ruptured. Diagnosis—adenocarcinoma of cervix. The cervix had entirely disappeared and there was a crater at the vault of the vagina.

One of the patients here reported was under thirty. Peterson (4) in a recent study of five hundred cases of cancer of uterus, found twenty-three or four and eight tenths per cent. of his cases under thirty years of age. It is not so important how often cancer of the uterus can occur under thirty, as it is important to know that it does occur.

In conclusion, the following must be emphasized. A careful history should be taken of every case of pelvic disease, more especially when bleeding is a symptom, and, the physician must not be influenced by the age or social status of the woman; when making a pelvic examination, the patient must be approached with the firm determination of making a positive diagnosis.

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Suppurating Uterine Myomata*

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Suppurating uterine myomata are divisible into three classes: 1, subperitoneal; 2, interstitial, and 3, submucous. Only those cases in which pus formation occurred in myomata situated on the outer surface of the uterus or located in the musculature are described. The submucous variety has certain characteristics that are totally different from those of the other two classes and are, therefore, not discussed in this study. Necrosis of myomata is fairly common, much more so than suppuration. It is likely to occur in subperitoneal, interstitial or submucous tumors but, more especially, in the submucous nodules. It is more prone to develop in the larger tumors, but has been noted in even small myomata.

The necrotic areas are recognized as dirty grayish brown or dark reddish blue patches in the myomata. Such areas are clearly outlined, but the contrast between the myomatous tissue and the degenerated portion is not nearly so cleancut as in the cases where hyaline degeneration exists. In the necrotic areas the muscular striation is usually still visible, but the tissue is softer than usual. The necrosis is usually in the centre of the tumor but may be noted on the surface or near it. It may be limited to one area or there may be several foci of degeneration. Hyaline degeneration and necrosis are often noted side by side in the same tumor.

While some authorities class suppuration among the degenerative changes of uterine fibroids, the classification can hardly be said to be accurate, if by suppuration is meant the invasion of the tumor by pyogenic organisms of sufficient virulence to produce the abscess. The confusion of terms may be due to the fact that, in many reports, suppuration is taken more or less for granted without a histological or bacteriological study and, also, to the frequent association of gangrenous degeneration and abscess formation.

Infection of a uterine fibroid is most likely to take place during actual sexual life. Sometimes years elapse before suppuration sets in after the first symptoms of tumor formation is apparent. Impaired circulation, which activates the bacteria latent in the tumor, causes the infection. Other factors leading to infection of a fibroid are pregnancy, trauma from a surgical or obstetrical procedure, or, in the interstitial variety, by direct extension of infection from an endometritis, torsion of the pedicle, chemical irritation, or mechanical irritation. There is no type of organism peculiar to suppurative myomata. This has been revealed by bacteriological studies.

The time elapsing between the first signs of fibroid and the development of the infection indicates that the process is evidently not sudden. There may be a rapid increase in the size of the tumor accompanied by local tenderness, possibly by a discharge of pus from the vagina together with emaciation, and signs of a general septicemia. In connection with these symptoms a high leucocyte count should suggest a suppurating tumor since it is well known that leucocytosis is not a feature of the ordinary myoma uteri.

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With the advent of suppuration the symptoms may undergo a marked change. Instead of the usual dull, dragging pain, there is a sticking or lancinating pain in the lower abdomen. The patient may have chills and fever at times accompanied with night sweats. One of the more important late symptoms is the sallow color. This differs entirely from the pallor that is so frequently noted where there has been great and prolonged loss of blood from submucous myomata. The patient grows progressively weak if septic absorption has taken place and the tumor seems, at times, to diminish in size. Renal changes take place and albumin and casts appear in the urine. If the suppurating tumor opens into the uterine cavity there is a profuse foul smelling vaginal discharge.

The prognosis is grave. If the tumor is small, nonadherent, and can be removed without danger of rupture and the spread of its contents, the prognosis is much more favorable, although these cases, like cases of cancer, are usually in a state of lowered vitality from toxemia or toxic absorption. In case a pregnancy is complicated by a myoma, it is important to lay more than usual stress on aseptic precautions during pregnancy, parturition and during the puerperium, and to remove the fibroid as soon after the termination of pregnancy as feasible.

The cause of suppuration in uterine myomata is not always clear. In the majority of cases hyaline degeneration is also present, probably due to a diminished blood supply. In many cases infection from the intestine has been thought to be the cause, especially where there have been intimate adhesions to the intestine. Kelly and Cullen report two such cases in which this was evidently true.

Infection easily takes place in interstitial myomata that impinge on the uterine cavity, when there is a focal necrosis or hyaline degeneration in those portions near the uterine cavity, and an infective agent in the uterine mucosa. Suppuration in a myoma must not be confused with the cases showing the presence of tuboovarian abscesses, and as a result secondary and encysted abscesses developed in spaces between contiguous myomata. Here the suppurative process is confined, almost entirely, to the outer surfaces of the tumors and not to their interiors.

Hyaline degeneration in a fibroid often simulates abscess formation so closely that it is impossible to render an absolute diagnosis without making sections. In simple hyaline degeneration no nuclei are present. If abscess formation has taken place, the characteristic polymorphonuclear leucocytes are in evidence.

Too much emphasis cannot be laid on the importance of early surgical interference in the treatment of suppurating myomatas, especially before complications have a chance to develop. The patient's resistance is naturally much reduced from toxemia. The pulse, just before operation, may be very rapid as is so often the case when pus is present. Supravaginal hysterectomy should be performed just as soon as feasible. The patient does not improve by delay, but, on the other hand, grows steadily worse. The purulent process in these cases is unusually active and the consequent dangers of infection are great.

Suppuration of myomata, as shown by statistics, is rare and yet I cannot but feel that, if every tumor removed in every hospital were cut open and examined, we would find it much more common than we think. A review of the myomata of the uterus operated on at the Woman's Hospital in New York for the year 1918, and reported by LeRoy Broun, comprising 262 cases, showed but one case of suppuration with pus cells infiltrating the tumor tissue. Necrotic changes, however, occurred in seven cases. In the wide experience of Deaver in the Lankenau Hospital, Philadelphia, in a series of 1,200 cases, only one case of suppuration was encountered. In my own experience of several hundred hysterectomies for myomatous uteri, there have been four cases of suppuration. With this evidence of the infrequency of this complication, a report of some of the cases may be of interest.

Case I.—Mrs. J. C. W., aged thirty-four, entered the hospital on April 9, 1921, complaining of a sharp pain in the lower abdomen. She had noticed a mass in the abdomen for the past two years, which had increased in size but had not given her any serious trouble until about two weeks ago. There was a rise in temperature and night sweats several days before she applied for relief. Her menstrual history was normal. She had an irritating leucorrhea and burning on urination. The patient was well nourished and slightly delirious with a hot dry skin. There was a nodular movable mass in the lower abdomen which did not fluctuate. The cervix was normal, but the pelvis was filled with a tender hard mass. Urine was negative. The blood count revealed a leucocytosis of 21,300. The Wassermann test was negative.

On opening the abdomen a nodular mass at the fundus of the uterus, about the size of a grape fruit, with other smaller tumors to which the omentum was adherent, presented itself. The tubes and ovaries were normal. A subtotal hysterectomy was performed. One of the nodules was softer than the others and on section showed an irregular pocketed pus cavity filled with greenish pus. Bacteriological examination showed many pus cells a few gram negative and intracellular diplococci. The other nodules were of the usual fibroid type and showed no degeneration. The walls of the abscess cavities were lined with partially necrotic fibrous tissue, richly infiltrated with pus cells. The patient made an uninterrupted recovery.

Case I.—Mrs. A. M., colored female, aged fifty-three, weight about 220 pounds, had an umbilical hernia and said that her abdomen began to enlarge about fourteen years ago. She always had profuse menstruation lasting about five days, but had passed the menopause five years ago. She had an unpleasant leucorrhea. She had had no children or miscarriages.

At operation a large mass of fibroid nodules, which weighed fifteen pounds, was removed. The ovaries were enlarged and the tubes much lengthened. There were numerous old adhesions of an inflammatory nature. The mass was removed by hysterectomy. One of the large nodules, which did not seem as hard as the rest, showed on section many ragged cavities filled with pus. These cavities penetrated the tumor mass to distances of from five to seven centimetres and burrowed their way irregularly in all directions.

Case III.—E. D., well developed colored woman of thirty-six years of age, weighing 140 pounds. There was nothing significant in her history except that of menstruation. Her periods were not painful, but profuse and lasted six days. On examination the whole pelvis was filled with nodular masses of all sizes and immovable. When the abdomen was opened, everything was found to be agglutinated, together with inflammatory adhesions due to successive attacks of peritonitis. The appendix was bound down by sheets of adhesions. A subtotal hysterectomy was done with difficulty on account of the complications. Two of the masses were found, on section, to be suppurating and the conditions were similar to the other cases. Both of these patients recovered.

Case IV.—A mulatto woman of about fifty-five years, very septic, with daily evening rise of temperature and sweats, entered the hospital. She had a large abdominal mass reaching above the umbilicus. On opening her abdomen the mass was found to be adherent to the whole anterior abdominal wall, and to practically everything else in the abdominal cavity. The adhesions were most extensive. The omentum was adherent over the tumor mass. Large omental bloodvessels passed from the omentum straight into the tumor, giving it an adventitious blood supply. Some of these vessels were as large as an ordinary lead pencil. Ligation had to be carried out with great care in order not to tear into the friable structures and produce severe hemorrhage. The mass was finally freed from its innumerable adhesions, but anywhere on its surface if the finger were pressed against the tumor it sank into a softened mass of tissue which was a perfect honeycomb of pus that exuded from everywhere. A hysterectomy was accomplished with difficulty. Needless to say the patient, who was very toxic to start with, succumbed from septic infection in about three days.

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Etiology of Eclampsia

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It is generally agreed by most of the recent and well known authorities on the causes of eclampsia that it is due to a toxemia. When the causal agent in toxemia, whatever it may be, is allowed free play, when its pernicious activity is not arrested either by treatment or by the efforts of nature, the result is eclampsia. The immediate cause of the convulsions does not enter into the question, at least not directly. The question to be answered here is, what is the cause of this condition which gives rise to the convulsions? It assumes that it is a certain toxin circulating in the maternal blood that causes the symptoms of preeclamptic toxemia and eventually the coma and convulsions. But what is this toxin? This is still a vexed question. Formerly it was thought to be uremia, and the cause of uremia was thought to be a nephritis complicating pregnancy. The study of the pathology of the disease, however, shows that the kidney changes are secondary rather than primary, and that the changes in the liver are more marked than those of the kidney. This, together with the clinical history of the two conditions, has proved the theory false.

The theory of autointoxication was first advanced by Bouchard, and according to him, the cause of eclampsia was due to inability of the kidneys to perform their work in the elimination of the excess waste matter that must be disposed of during pregnancy. This he sought to prove by showing that the urine and blood serum of eclamptics injected into animals, were more poisonous than normal urine and blood serum. Various authors have disproved this theory by showing that the toxic properties of these fluids are due to their concentration and that when diluted up to the normal standard they have no toxic action. The autointoxication theory in one form or another has always been popular in France, and Fabre and others now hold strongly to the belief that the absorption of decomposition products from the intestinal tract is the real cause of eclampsia. Bacterial infection has been attributed the cause of eclampsia, but the offending organism has not yet been found. Schmore and Dienst, noting the frequency of multiple thrombosis in eclampsia, attributed their presence to the invasion of the blood current by an excess of fibrin ferment. Dienst went further and attempted to explain why the fibrin ferment was increased. There was, he stated, an antithrombin which should normally neutralize any excess of coagulating material. This antithrombin was produced in the liver, but during pregnancy this organ may have become unequal to the task.

The modern biological theories and hypotheses have recently been much invoked in efforts to discover the cause of eclampsia and of these theories Veit has been the most prominent exponent. It is well known that during pregnancy the blood is invaded by certain fetal elements, for example, the syncytial elements of the placenta, which but for the development of a hypothetical antibody would do harm if present in excess and that in eclampsia this antibody was not present. Bandler in his latest book on endocrines quotes that placental secretion is the important factor, and it does not produce this annoyance in a large proportion of cases because some protective substances are secreted or formed anew. They come from the ovary corpus luteum, from the thyroid and adrenals, from the hypophysis, from the liver and from other structures in the body not yet recognized as taking part in this protective function.

Then we have a certain number of cases in which this function is not properly carried out with the result that placental secretion exerts a decidedly irritating influence. Placental secretion is a substance which follows closely the course of the blood, in all the organs of the body producing changes of marked character, particularly in certain instances in the liver with marked alterations in metabolism. These changes are of a necrotic nature and a hemorrhagic type, showing the irritating nature of this secretion. If the usual protective substances are lacking this secretion takes on an irritative destructive nature. The changes, microscopic in nature, are produced typically in the brain, associated occasionally with hemorrhage of graver type and with edema more or less diffuse and often quite marked, and associated with pressure in the spinal cord, then convulsions and coma. Thyroid insufficiency has been held by Lange, Nicholson and others to be the cause. It is probable that if thyroid extract does good in these cases it must be by its well known effect in stimulating general metabolism and indirectly oxidation. Zweifel has suggested that lactic acid which has been found in the blood and cerebrospinal fluid of eclamptics may prove to be the cause. Somewhat analogous theories have been advanced by Ascoli, Weichardt and Hofbauer and contradicted by Frank, Heimann and Lichtenstein. It is plain even to the uninitiated that these theories rest upon unverified assumptions.

On the whole it seems plain that the cause must be bound up with the presence in utero of the living growing fetus. The fetus may die as a result of the eclamptic poison or poisons. Seldom or never does eclampsia develop in a mother carrying a dead fetus.

Furthermore it is evident that the fetus must have reached an advanced stage of development since eclampsia usually occurs in the later months of pregnancy. The most encouraging and significant studies that have recently been made have been those of Zweifel, Williams, Stone, Ewing and others in connection with nitrogenous metabolism in pregnancy. The studies have shown conclusively that during pregnancy large quantities of nitrogenous substances are excreted by the kidneys in a state of complete oxidation. It is assumed that this incomplete oxidation must be the result of some toxin of unknown origin circulating in the maternal blood and interfering with the oxidative function in the liver or the eliminative work of the kidneys or both.

While the main facts expressed above are true it does not necessarily follow that we need to assume the existence of some special toxin. May it not be that suboxidation itself is the real cause, or at all events a prominent factor? In pregnancy a woman needs oxygen more than at any other time. Without this excess supply she cannot hope to meet the relatively enormous demands of fetal and placental metabolism. Moreover, in the later months of pregnancy her oxygen supply is limited, owing to the diminished abdominal space and consequently limited excursions of the diaphragm. This is especially true in cases of external distention, viz., in hydroamnion and twin pregnancy and it has long been known that these two conditions predispose to eclampsia. The clinical symptoms of toxemia of pregnancy come from the subjective dyspnea so common in pregnancy. The headache, edema and finally the convulsions are strongly suggestive of a lack of oxygen. No other hypothesis helps to explain the unexplicable but undoubted fact that eclampsia usually occurs in robust and vigorous young women. These patients have a high oxidative equilibrium and are the first to suffer from oxygen deficiency. Well being is a sign of the absence of toxins and suboxidation and whenever a woman in the later months of pregnancy does not feel well pretoxemia should be constantly considered and reconsidered, until it may be absolutely excluded by a decided change for the better in the patient's general condition.

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Ascertaining the Viability of the Fetus

By L. DROSIN, M. D.,
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The practice of obstetrics is as old as humanity itself; but the obstetrical practice of today bears little relation to that of the cave man and the stone age. When we consider that it was but slightly more than a century ago, in 1818, that the possibility of auscultation of the fetal heart was accidentally discovered, and many years later before the principles of asepsis were applied to midwifery, these two introductions marking the most important diagnostic and therapeutic advances ever made in this particular branch of medical science, it is borne in upon us that obstetrics is still a growing and expanding science, far even yet from perfection and completion. Therefore, any addition, however trivial, which serves to advance the knowledge of the art, or to increase the skill of those who practice it, should not be permitted to remain unreported.

IMPORTANCE OF DIAGNOSIS.

The importance of a reliable method of ascertaining the viability of the fetus can hardly be overestimated. To the patient it is often of the utmost interest, legally, socially, morally or financially. To the obstetrician it is of paramount importance as a guide for all therapeutic procedure.

CAUSE OF DEATH.

The death of the fetus may be the result of a wide variety of causes. These causes may be attributable to either paternal or maternal influences, may be inherent in the fetus itself, or subsequent to outside factors, trauma or other accidents. Fetal death may occur at any time during pregnancy, or at term during the period of labor.

A dead fetus is not a menace to the life or health of the mother, except that when death occurs after rupture of the membranes it will putrefy, causing a septicemia or general suppurative peritonitis which is often rapidly fatal. When fetal death takes place early in the period of gestation there is a cessation in the growth of the uterus, the abdomen does not increase in size—if pregnancy is far enough advanced for abdominal enlargement to be visible—and in some cases the secretion of milk will begin. Subjective symptoms, such as a feeling of weight and discomfort in the pelvis, chilly sensations, depression of spirits and loss of appetite may be present. When the fetus dies in the later months we have in addition to cessation of the growth of the uterus and enlargement of the abdominal circumference, disappearance of fetal movements and heart sounds. Not only does the uterus cease to grow, it even becomes smaller. After the fetus has been dead for some time, so that maceration has taken place, there will be loss of resiliency and crepitation of the fetal skull. Changes may usually be detected in the maternal urine also, peptonuria, albuminuria or acetonuria often appearing. According to Cohnstein and Fehling, if the fetus is alive, the temperature of the uterus should be higher than that of the vagina.

Where the patient has presented all the objective symptoms of pregnancy, cessation of menses, enlargement of abdomen, breast signs, and sensations of fetal movement, particularly if these symptoms have been observed and corroborated by a competent physician who has been able to elicit ballotment and fetal heart sounds as additional evidence, if there is a gradual or sudden cessation of all these symptoms, we often find that the diagnostic methods available are very imperfect, and time consuming. For we know that it is quite possible for all fetal movements to be suspended, that subjective symptoms may disappear, palpation and auscultation reveal nothing, urinary changes to be negative or doubtful, and the child be still alive. In such a case our only resource is repeated palpation and auscultation, abdominal and uterine measurements.

Under such conditions I have found two procedures of value in establishing the viability of the fetus, and have employed them successfully a great many times, both separately or in combination.

DECREASE OF OXYGEN TO THE FETUS.

The patient is placed in the recumbent dorsal position, with the legs either flexed or extended. She is then directed to exhale and suspend respiration for as long a time as possible. Repeat this maneuvre from ten to fifteen times (no exact number can be laid down). In order not to exhaust the patient she should occasionally be allowed to take a few moderately deep inspirations during the procedure.

As a result of the interrupted respiration of the mother, the oxygen supply to the fetus is disturbed and diminished; the fetus, becoming restless because of air hunger, will begin to move. Sometimes these movements will be very active; at others just barely sufficient to assure the existence of life.

ELICITATION OF SHOULDER MOVEMENT.

Locate the anterior shoulder of the fetus (this sometimes requires a long and diligent search), press gradually but firmly upon it with the tips or palmar surface of the fingers, exerting the pressure in an upward and backward direction, and the following phenomena will be elicited.

The shoulder, assuming a vermiform action, will turn in a direction successively backward, upward, inward and downward; this movement may possibly be repeated several times. The shoulder motion is more or less shared by the entire body, these movements being palpable to the examiner's free hand when laid upon the mother's abdomen, being perceived as a wriggling of the trunk and rapid motions of the extremities. If the examiner's fingers are placed in the vagina he can usually feel the head moving.

It appears that the tip of the shoulder is sensitive for some reason, so that in trying to evade the intruding hand it assumes an attitude of exaggerated flexion (usually lateral), of extension and rotation, which is participated in by the entire fetal body, the different parts being affected in rapid succession. At times we can elicit only the shoulder movement alone, and at others only those of the breech and extremities. I have often produced this phenomenon in sleeping newborn infants by pressing upon tip of shoulder, in the manner described.

These movements may not be brought about at the first examination, and in some cases not at all, especially if the abdominal walls are thick or much fluid is present in the abdominal cavity. In three cases where conditions were favorable for the employment of this diagnostic procedure I was unable to bring about any movements or heart sounds by either of the methods here described, although the examinations were repeated at two or three day intervals over a period of three to four weeks. In all three cases the fetus subsequently proved to be dead, two because of syphilitic infection and the third—the mother's previous deliveries having been spontaneous and normal—being due to a blow upon the abdomen. These three patients were each about seven months pregnant, and came under my observation very shortly after they had ceased to be conscious of fetal movements. Each was delivered of a dead and macerated fetus within a few weeks of the time she consulted me. One of these patients showed a trace of acetonuria shortly before delivery, and another manifested a small amount of albumin in the urine during the remainder of her pregnancy, although unfortunately I am not in a position to say whether she had it before or not.

In addition to these three patients, out of fifty-four cases where fetal death was suspected which have come under my observation in the last two and a half years, I was able to bring out fetal movements at the first or second attempt, in forty-nine, using one or both methods. In forty-four cases I succeeded in eliciting fetal heart sounds. The remaining patients failed to return, so that the cases were lost sight of, and could not be followed up.

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The Natural Limit of the Duration of Human Gestation

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In the English Law Courts on July 20, 1921, in the case of Gaskill v. Gaskill, it was decreed that what was to all intents and purposes a normal case of uterine pregnancy could extend over a period of 331 days and I would observe and emphasize the fact that this period of 331 days was reckoned neither from the commencement nor from the cessation of the last menstruation but from the latest date on which insemination by the husband could possibly have occurred.

Such a declaration emanating from an English Court is most assuredly to the scientific and medical world a matter of no mean importance as quite inadvertently it may find its way into textbooks and be thus for a greater or less length of time disseminated not only as a feasible but as a tenable and universally accepted proposition, consequently it behooves us without undue delay to discuss it and at the same time determine whether it is a scientifically sound pronouncement. In order that we may be in a position to arrive at some definite conclusion thereon it is imperative that we should even somewhat briefly review our known facts concerning human pregnancy.

I would, however, at the outset remark that most of the phenomena associated with the reproductive process in woman are extremely intricate and somewhat obscure and for these reasons unfortunately they have proved only too favorable to the propagation of beliefs which, as we shall presently learn, are clearly erroneous and they have become so deep rooted in the minds of many that they will not be easily eradicated.

Most of my readers no doubt have either seen it stated or have been informed that women who have never menstruated and who are incapable of menstruating have and may nevertheless become pregnant. Now, because of the number of women I have seen who have lived many years in wedlock and who had never menstruated, I have no hesitation in asserting that such a statement as the foregoing must have originated through and must be attributable to some error of judgment and carelessness in the investigation and interpretation of facts. No one can validly challenge the statement that the ability to harbor and sustain and develop a fertilized ovum is indissolubly connected with the ability and power to display the recognized phenomena of menstruation. An abundant supply of readily available oxygen is absolutely necessary for starting and carrying on in the fertilized ovum those chemical reactions and changes which are metabolic in character and which are concomitants of the phenomena of life; and if the generative organs of the woman cannot function autogenetically and manifest the phenomena of menstruation then because the bloodvessels which should respond to the demands of a fertilized ovum have never been and can never be autogenetically activated, and because the oxidative powers and processes of the generative organs never consequently exceed those necessary for maintaining the organs merely in a resting state, gestation cannot occur. To this very important assertion we shall again have to refer to later.

It will moreover be readily conceded that except when menstruation is held in abeyance by lactation no woman living a regular marital life is justified in entertaining the notion that she has conceived, and no medical man is ever suspicious of the existence of uterine pregnancy in the case of any woman until and unless a menstrual period is missed. Solely on this account but aided and guided of course by statistics it became and is even still customary to reckon the stages of advancement and the probable date of parturition in any given case of pregnancy either from the commencement or the cessation of the last menstrual discharge. That this rough and ready method of reckoning has to a certain extent proved satisfactory and successful is indisputable and the reason of this we shall presently take note of, but it nevertheless must be very evident to all medical practitioners that it is not only unscientific but unsound. Embryologists even have not escaped the pitfall for they, too, have unfortunately adopted this same datum from which to reckon the age of any given embryo and assign dates to the various stages of embryonic development.

The modicum of success which has attended the aforesaid method of foretelling the probable date of parturition is entirely due to the fact that a large percentage of women menstruate every twenty-four to twenty-eight days and to the fact that gestation begins—in the case of every woman who has conceived—at a definite and fixed time. On account of a misinterpretation of facts there has prevailed and even still prevails the belief that when fertilization takes place it is most commonly effected immediately after a menstrual period. Today it must to us seem somewhat remarkable that this belief should ever have been seriously entertained, because it was well known throughout the ages that the Jews were a prolific people and that the strict Jewess, in bygone days anyway, adhered to and observed most religiously the Mosaic law which forbade her to have intercourse with her husband until she had numbered seven clear days from the cessation of her menstrual discharge and had had the prescribed bath. Over and above this we are in possession of abundant clinical evidence that fertilization may take place as a result of a fruitful intercourse occurring at any time during the intermenstrual resting period seven clear days from the cessation of her menstrual discharge of one period to two days prior to the date of the next expected menstruation.

Firmly implanted in most minds there exists the further erroneous belief that the beginning of gestation follows immediately on fertilization. Let us for the moment assume that fertilization and the beginning of gestation are simultaneous events. Then because fertilization may be effected at any time during the intermenstrual period the infant resulting from an ovum fertilized immediately after a menstrual period would, according to our present method of reckoning the probable date of parturition, be born three weeks at least before the infant resulting from an ovum fertilized just before an expected menstruation, and it clearly would be futile for us even to attempt to prognosticate the date of the birth of any infant. The aforesaid belief has no valid basis for its existence and maintenance and if we would view aright the question of the natural limit of the duration of human gestation we must banish it forthwith from our minds.

In support of this statement I would adduce at the outset our knowledge of what happens in the case of the germination of vegetable seeds and the incubation of birds' eggs. The egg of the domestic hen may be kept for twelve or fifteen days and then incubated while the seed of some cereals may be kept for years and then subjected to the conditions favorable for germination. Here then we are forced to accept the dogma that the fertilized cereal seed, although endowed with the power of life, requires the timely cooperation of some favorable extrinsic agent or agents to start life in it, and what is true of the vegetable seed is likewise true of the fertilized bird's egg and the fertilized human ovum. As indisputable clinical evidence that gestation begins at a definite and fixed time in the case of every woman after a fruitful intercourse I would instance the fact that it is impossible for even the most experienced medical practitioner to detect by physical examination the existence of uterine pregnancy in the case of any woman earlier than fourteen days after the date when the first missed menstrual period was expected and for the reason that at this stage the pregnant uterus is approximately of the same size and consistence in every normal case. In a case where fertilizing was effected and gestation begun immediately after the cessation of a menstrual period one would naturally expect the pregnant uterus fourteen days after the first missed period to be larger than in a case where fertilization was effected and gestation begun just before the date when the first missed period was expected. In the former case the pregnancy would be nearly three weeks anyhow in advance of the latter. As corroborative evidence I would instance the fact that morning sickness, which is a common symptom associated with the pregnant state, is never experienced earlier than the time when the first missed period was expected, and this is the first symptomatic evidence we have of the presence of an actively progressing germ plasm. It is because gestation begins at a definite and fixed time in the case of every woman who has conceived that our prognostication of the probable date of parturition meets with any measure of success at all, and no matter when the fruitful intercourse may have occurred it is because gestation begins at a definite and fixed time that we are unable to detect the existence of uterine pregnancy earlier than fourteen days after the date when the first missed period was looked for. The latter pronouncement holds good also of those cases in which menstruation is wont to recur every five or six weeks instead of every twenty-four or twenty-eight days. As I have already observed, an abundant supply of readily available oxygen is necessary to start in the human ovum those chemical changes which characterize life, and as the generative organs in the resting stage cannot furnish this requirement the germ plasm, endowed with the power of life but as yet incapable of displaying the phenomena of life, awaits the activation of the generative organs which but for the presence of a fertilized ovum would induce menstruation; for menstruation, like the beginning of gestation, requires an abundant supply of oxygen. If now we reflect, scan carefully and interpret aright our facts, we are forced to conclude that gestation in the human female begins invariably when the generative organs begin to be activated for the occurrence of a menstrual period which is inhibited because of the demands of a fertilized ovum.

Embryologists, therefore, in reckoning the age of any given human embryo and in assigning dates to the various depicted stages of our embryonic development will sooner or later be compelled by force of circumstances to make their calculations not from the date of cessation of the last menstruation nor from the alleged date of one insemination but from the date on which the first missed period was expected.

Having determined that the time when gestation starts corresponds in all cases with the time when the first missed period was expected, let us now turn our attention to the question of the natural limit of this physiological process, and on this point we may glean some important information from the happenings in cases of full time extrauterine pregnancy. When gestation occurs outside the uterus the fetus in its abnormal location may nevertheless attain maturity and be as perfectly nourished and developed as if it had been lodged in the uterus. If, however, it is not delivered, by an abdominal section of the mother, before the natural limit of the duration of gestation is reached, it perishes. Fortunately and yet unfortunately it dies without a struggle and without the mother being in a position to throw any light upon or express any opinion as to the time when it probably perished. That it dies selfpoisoned through a lack of oxygen there can be no doubt. We, however, are not altogether without circumstantial evidence as to the probable time when it perished.

I have elsewhere and on many occasions drawn attention to the fact that after a normal pregnancy and parturition if the mother makes no attempt to suckle the child it not infrequently happens that the menstrual function reasserts itself about six weeks after the confinement, or, roughly speaking, about eleven and a half months after the date of the last menstruation in the case of a woman who is in the habit of menstruating every twenty-four to twenty-eight days. Now in some cases of full time extrauterine pregnancy and while the infant is still located in the mother's body we witness this same tendency for the menstrual function to reassert itself about eleven and a half months after the date of the last menstruation. This being so we may take it that so far as the reestalishment of the menstrual function is concerned the normal removal of the practically mature infant from the uterus is an event analogous with the intramaternal death of the full-time extrauterine infant. Judging, therefore, from what happens in cases of full time extrauterine pregnancy it is quite evident that there is a well defined natural limit to the duration of human gestation. If we would reckon scientifically and soundly we must reckon, however, from the time when gestation starts, i. e., from the date on which the first missed period was expected. Reckoning from this datum statistical evidence supports the opinion that the limit of duration of human gestation is nine lunar months or 252 days. For the guidance of those practitioners who may continue to rely upon the customary and rough and ready methods of reckoning the probable date of parturition I would observe that their allowance of ten lunar months holds good only in cases where the menstrual cycle of the woman does not exceed that of one lunar month or twenty-eight days.

123 HARLEY STREET.

Tuberculosis and Pregnancy*

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The effect of pregnancy on pulmonary tuberculosis has been the subject of widely conflicting opinions for the past century and a half. The older writers believed that pregnancy has a distinctly favorable effect on a coexisting tuberculous lesion, even to the extent that of two women in the same stage of the disease and of the same degree of severity the one who becomes pregnant will with certainty survive the other. Since the middle of the last century two diametrically opposed views have dominated medical thought.

On one side it is maintained that in the majority of cases, pregnancy has a decidedly unfavorable influence on the course and prognosis of active pulmonary tuberculosis; that it is responsible for the reactivation of latent and inactive disease, and that its onset can frequently be traced to a previous or existing pregnancy. Another group of observers holds that there is no definite evidence for assuming that pregnancy as such hastens the progress of tuberculosis or shortens the life of a tuberculous woman; that its unfavorable influence is negligible and has been overemphasized and overestimated.

Irreconcilable as these views appear, a close analysis of the extensive literature of the past two decades evidences, if we eliminate extremists, a certain degree of agreement in so far as the influence of pregnancy on certain types and stages of tuberculosis is concerned, and that the majority of clinicians hold that pregnancy must be looked upon as a serious complication in a tuberculous woman.

Theories and experimental work are not lacking to support and explain either view. Upward pressure on the diaphragm by the increase in size of the gravid uterus is believed to be the cause of the alleged favorable influence of pregnancy by producing a decrease in the volume of the lungs, and lessened expansion and respiratory capacity, which factors together with the increased work thrown upon the heart result in a hypertrophy of the right ventricle and a hyperemia of the lungs. The influence of this hyperemia in the lesser circulation may be compared to that occurring in certain cardiac and particularly mitral lesions which are unfavorable to the development and activity of pulmonary tuberculosis and favor a tendency of lesions to become fibrous, encapsulated and inactive.

The high position of the diaphragm and consequent compression of the lungs in pregnancy is also said to act analogously to the effect of a slowly increasing artificial pneumothorax. Progression of the disease which sets in after parturition is on the basis of this hypothesis due largely to a release of this pressure and a sudden reexpansion of the lungs.

Other observers, on the contrary, hold that it is the high position of the diaphragm and the resulting compression of the lungs, the change in the type of respiration and in the pulmonary blood supply which are the most important mechanical causes of the progression and reactivation of pulmonary tuberculosis.

Cornet (1) lays the blame on the severe expulsive and the deep inspiratory efforts during parturition by which tuberculous secretions are aspirated into healthy areas. This according to him explains why rapid progression of the disease so frequently sets in from a quarter to a half year after parturition.

Of serobiological changes occurring during pregnancy which are alleged to have a deleterious influence on pulmonary tuberculosis may be mentioned a decrease in the antitoxic and bactericidal substances of the blood and in its fat splitting power which normally constitutes one of the defensive mechanisms against the tubercle bacillus. Hofbauer (2) has shown experimentally that there is an increase in the lipoids and especially the cholestrin esters of the blood during pregnancy. These are said to furnish a more favorable medium for the growth of tubercle bacilli and thus to increase the susceptibility of the pregnant woman to reactivation and progression of tuberculous lesions.

The abstraction of lime from calcified tubercles, particularly during the latter part of pregnancy, for the needs of the growing fetus is another hypothesis to account for the reactivation and aggravation of the pulmonary disease.

Sergent (3) seeks to explain the relation between pregnancy and tuberculosis by the function of the adrenals which according to him is impaired in both conditions. Inactive forms of tuberculosis are very little influenced by pregnancy because in this type of the disease the function of the adrenals is little disturbed.

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* Read before the New York Physician's Association, February 24, 1922.

However, neither these nor other theories or experimental work on animals are convincing in proving or disproving one or the other view. The decision of the question rests on careful clinical observation. The diversity of opinion has been said to be due largely to differences in the clinical and pathological forms of the disease which have come under observation. It has been said that clinicians who have not observed the deleterious influence of pregnancy on tuberculosis have had to deal with inactive, mild and favorable types of the disease, and those who claim its more or less uniformly unfavorable effects with cases in which the prognosis was bad without regard to the pregnancy. There is, however, no definite relation between the type of the pulmonary disease and the favorable, indifferent or deleterious influence of pregnancy except that as a general rule the effects are worse the more active and advanced the disease.

Reactivation or progression of a pulmonary lesion as a rule begins to manifest itself during the first three months of pregnancy and assumes a serious aspect in its latter half. In a minority of cases there is a definite tendency to improvement after the fourth month. In such cases and in those who do not show signs of progression of the disease during the entire term it frequently becomes increased after parturition and leads to a fatal termination in a large proportion of cases during the puerperium.

Begtrup-Hansen (4) finds the alleged difference in the effects of the first and second half of pregnancy to be due to the same causes which underlie the effects of the premenstrual and postmenstrual periods on pulmonary tuberculosis. The first three months of pregnancy and the premenstrual period are both characterized by the same type of temperature and an aggravation of the disease due to increased tissue waste. During the latter half of pregnancy and the postmenstrual period the postmenstrual type of temperature and a state of hypernutrition, increase in weight and improvement of the lung condition prevail. Although he does not deny that other factors may be concerned in lessening or increasing the resistance to the development and progression of tuberculosis he considers the changes in the metabolic processes during the two periods of pregnancy and the corresponding menstrual periods as the most important.

A direct corollary of the injurious effect of pregnancy on active pulmonary tuberculosis is the question of whether the pregnancy should be allowed to go to term or whether it should be interrupted. On this phase of the subject we also meet with conflicting opinions which in the final analysis hinge largely on whether or not the prognosis of the pulmonary disease is improved by interference. Another point of contention is the period of pregnancy during which it is most advisable to terminate it.

Most clinicians advise early interruption. They find that termination of the pregnancy during the first three months is most favorable for the pulmonary disease and that after the fourth month artificial abortion rarely gives satisfactory results. Pankow and Kupferle (5) have reported the most extensive study on this question and show that termination of the pregnancy during the first three months results in improvement and favorable course of the lung disease in eighty-seven and nine tenths per cent., between the fifth and seventh month in thirty-three and three tenths per cent. and between the eighth and ninth month in twenty-nine and four tenths per cent. Artificial induction of labor between the eighth and ninth month gives a mortality of forty per cent. in second and one hundred per cent. in third stage cases. The results are worse the more advanced the disease. In the third stage of tuberculosis no benefit is derived in one hundred per cent. of cases.

Other observers while admitting that pregnancy may prove a serious and even dangerous complication in tuberculosis, do not favor its interruption except under limited indications because they have not found it of any favorable influence on the course and prognosis of the pulmonary disease.

My personal observations have placed me firmly on the side of those who hold that pregnancy in a clinically tuberculous woman must be looked upon as a serious complication of decidedly unfavorable prognostic import in regard to the pulmonary disease. Although no dogmatic attitude on the subject should be taken the following summary may be regarded as a working basis for the obstetrician and the internist who may be called upon to decide whether or not a tuberculous woman may safely bear a child or for or against termination of a pregnancy.

SUMMARY.

1. Pregnancy is not an important etiological factor in the development of pulmonary tuberculosis. In a considerable number of cases, however, the disease develops following parturition and during lactation as a consequence of the debilitating effects of these periods.

2. A diagnosis of active pulmonary tuberculosis in a pregnant woman should be made only on positive evidence. It should be remembered that pregnant women may normally show temperature variations which may lead to the suspicion of incipient tuberculosis.

3. Old tuberculosis of slight extent with physical signs of a latent and inactive peribronchial condition is rarely reactivated as a result of pregnancy. Latent and inactive parenchymatous lesions of the same extent more frequently become active and progressive. In early clinically cured cases pregnancy may be permitted under favorable social and economic conditions. All such patients should, however, be carefully observed for signs and symptoms of reactivation and should be treated as potential cases of active tuberculosis. Primipara and women with pregnancies following rapidly one after the other are especially in danger of reactivation during pregnancy.

4. The majority of cases of active pulmonary tuberculosis in all stages and of quiescent or arrested disease, especially if advanced, are distinctly unfavorably influenced by pregnancy. Such patients should be advised against pregnancy and instructed in the safest methods of contraception. The disease generally begins to progress during the first three months of pregnancy or following parturition. In active disease of any extent it is safe to adopt the

dictum of the French school: "If a girl, no marriage; if a wife, no pregnancy; if a mother, no suckling."

5. A small number of patients with active disease, are not deleteriously influenced by pregnancy. The improvement in the pulmonary disease occasionally observed occurs despite of and not because of pregnancy. The old belief that pregnancy has some peculiarly favorable effect on pulmonary tuberculosis has been properly stigmatized as superstition.

6. There are, however, no positive symptomatic criteria by which we can foretell which patients will be unfavorably influenced and which will go through the pregnancy without serious ill effects.

7. The probability and the degree of unfavorable effect is the greater the more advanced the disease.

8. As a general rule the prognosis of the pulmonary disease is decidedly worse than in similar cases without the complication of pregnancy, if there is present: a, impaired nutrition and particularly a persistent loss of weight; b, laryngeal tuberculosis; c, a persistently high pulse even without fever; d, continuous or periodic fever even without extensive pulmonary involvement; e, symptoms and physical signs of rapid destruction of pulmonary tissue; f, unfavorable social and economic conditions; g, symptoms on the part of the pregnancy such as hyperemesis, nephritis, severe chlorosis and nervous and mental manifestations.

9. No absolutely definite schematic rules as to the conditions under which interruption is indicated or when it shall be instituted can be laid down. It is largely a problem of a diagnostic and prognostic nature and hence one of individualization and careful observation by the obstetrician and the internist. We must take into consideration the stage of the disease, whether it is unilateral or bilateral, stationary or progressive, and whether it is complicated by other tuberculous or nontuberculous conditions. It should also be kept in mind that even if the disease runs an uneventful course during pregnancy the woman still has to face a dangerous period after parturition.

10. Before artificial abortion is resorted to the patient should be given the benefits of a thorough hygienic dietetic course of treatment and in suitable cases of artificial pneumothorax, which has been shown to be without deleterious effects on the course of pregnancy.

11. However, if under favorable conditions of treatment the disease remains active and persistently progresses or in the presence of the unfavorable symptoms I have enumerated interruption of the pregnancy is indicated in all stages of the disease during the first four months of the term. Laryngeal tuberculosis even without extensive disease of the lungs is a definite indication for the early termination of pregnancy. Early interruption is especially indicated in arrested cases which set up acute activity in the first few months of pregnancy and in cases which give a history of exacerbation and progression of the disease during a previous pregnancy.

12. After the fourth month interruption does not, as a rule, improve the prognosis of the pulmonary disease. It is permissible early in this period under urgent indications in moderately advanced cases without serious complications but is definitely contraindicated in prognostically unfavorable advanced cases.

13. Premature induction of labor on account of the pulmonary disease is practically always contraindicated.

14. The operation of choice for emptying the uterus prior to the fourth month is vaginal hysterotomy under gas and ether anesthesia.

15. Sterilization to prevent future pregnancies is justifiable only under exceptional circumstances, and only in multipara with living children, in women with rapidly following pregnancies and in working women.

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1215 MADISON AVENUE.

Gonorrhea in Women from the Aspect of a Focal Infection

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Despite the endless literature on the subject of gonorrhea in women, little advancement had been made towards an actual cure of this disease until very recently. This fact and some others seem to offer a sufficient excuse for an additional contribution to this timeworn subject.

SOCIOLOGY.

It is impossible to consider gonorrhea as a disease confined largely to prostitutes. Present social conditions have resulted in its widespread distribution. The war, by breaking down moral reserve, resulted in a freedom of sexual life hitherto unknown. Vast numbers of young women submitted to intimacies which they never would have allowed if their lovers had not been about to leave them for the uncertainties of war. Many girls attained a new freedom and independence during the war which separated them from the restraints of home. The moral atmosphere of the whole world has assumed an attitude of "Live for today, and let the morrow care for itself."

Since the enfranchisement of women by the enactment of the nineteenth amendment to the constitution, women have insisted upon the adoption and the recognition of the socalled single standard. This has removed another restraint, for they no longer fear the social ostracism which was formerly their lot if they broke the bounds of propriety. And now the rapid dissemination of contraceptive methods has removed the last barrier of fear as a restraint to free sexual life.

These and other conditions, in addition to the present high cost of living, which often precludes early marriages, have resulted in social arrangements which could not fail to facilitate the spread of gonorrhea.

SYMPTOMS OF GONORRHEA IN WOMEN.

The subjective symptoms of gonorrhea in women are unfortunately in many cases of a mild type and cause so little inconvenience and suffering that this disease is often overlooked or mistaken for a temporary cystitis. This is deplorable, because disease is dreaded in proportion to the suffering, morbidity and death it causes. This disease, so farreaching in its effects, not only on the individual but upon society as well, is not dreaded or feared as it should be, either by the male or the female.

In many cases the only subjective symptoms noticed in the female are a burning pain upon urination and some itching or smarting of the external genitalia, accompanied by an irritating discharge. So many women have leucorrhea, that they are inclined to consider the urinary symptoms separately. Often these clear up in so short a time that the condition is not even treated. It is only in a moderate proportion of cases that the infection is so virulent that it results in severe pelvic conditions and diseases of the adnexa. Many of these patients who seek medical aid are carelessly examined and treated by physicians in the routine of general practice. Thus these patients, by the establishment of a personal immunity, drift into the symptomatic stage of a chronic gonorrhea, and so remain for a long period of years a source of danger to any male companion, and a source of gonorrheal ophthalmia to any child they may produce.

My observations lead me to believe that these patients are at times infectious after a period of ten or twelve years, unless the special measures of treatment here outlined are carried out.

DIAGNOSIS.

From the time of infection gonorrhea in women presents an entirely different problem from the same disease in men. In fact, from the anatomy of the parts involved, even prophylactic measures in women are practically valueless.

While the male has only one external opening or outlet to his genitourinary organs, the female presents at least six distinct outlets connected with some part of her genitourinary organs. These six outlets, namely: the urethral orifice; the openings of the two ducts of Skene's glands; the openings of the two ducts of Bartholin's glands, and the orifices of the external os, are all capable of, and are likely to be simultaneously infected with gonorrhea, when sexual intercourse with an infected male takes place. Thus we can readily see that prophylactic and abortive treatments are practically useless in the female, and that from the start this disease in women presents a complex situation.

Laboratory aids in the diagnosis of chronic gonorrhea in the female are of even less value than in the male. The gonorrheal fixation test is of great value when positive. Dr. Hastings, in a personal communication to me, has pointed out that the fixation tests do not necessarily diagnose a focus of infection, but rather demonstrate that absorption of toxins into the blood stream is taking place from a focus of infection, so that a negative fixation test does not prove the absence of a local gonorrhea. Attempts at culture of gonococcus are unreliable. The examination of slides is only of value when the intracellular gram negative characteristic biscuit-shaped diplococci are positively found. Negative smears do not mean an absence of the disease, because the organisms become early imbedded in the tissues, and even irritation with silver nitrate, and other substances, fails to cause their appearance in the pus cells. Therefore the diagnosis must depend ultimately upon the history and the clinical pictures which the case presents to the examiner's sense of touch and vision.

Practically all women who have had gonorrhea will recollect a period of burning and irritation upon urination. This is the one classical subjective symptom of this disease in women. Besides this, they notice an increase in the vaginal discharge and a change from the mucopurulent character of chronic cervical focal infection, due to other bacteria, to a thin, creamy, profuse discharge, which is rather typical of gonorrhea.

It might be well to say here that I am not going to attempt to give all the symptoms and complications of the disease, as that would necessitate the production of a book of many pages. I merely wish to indicate what seem the more salient features and some new aspects of its danger and treatment.

Unless pelvic, joint or cardiac symptoms develop, many of these patients have no fever or general symptoms. The clinical features of acute gonorrhea in women are well known. In the acute stages, laboratory methods are generally positive, so that diagnosis is comparatively easy. In its chronic stage, however, the disease is difficult to diagnose.

In order to fulfill the purpose of this article, it is necessary to digress at this point and call attention to one aspect of gonorrhea in women that has been in the past almost, if not entirely, overlooked. It is this aspect which makes it a disease from the personal viewpoint greatly to be dreaded.

Every woman infected with gonorrhea sooner or later acquires a focal infection of the cervix resulting from a secondary infection of the cervical endometrium with some of the various forms of pathogenic bacteria with all the accompanying danger of systemic and mental diseases and disturbances which a focal infection of the cervix may produce.

It is not in the scope of the present paper to deal with these focal infections, but the interested reader is referred to the articles of Sturmdorf (1), Langstroth (2, 4, 7), Curtis (3, 8), and Rosenow (5, 6).

The fact, however, that is important to emphasize is that in every case of gonorrhea treated by the usual methods, the cervical endometrium becomes the site of a permanent focal infection. This infection is just as potent a source of systemic and mental disease as foci in the teeth, tonsils, gallbladder, prostate in the male, and other less frequent foci, which have been so carefully studied by men of such prominence as Billings (9), Bell (10), King (11), Bryant (12), Cotton (13), Lowsley (14), and many others.

In the study of the clinical picture of chronic gonorrhea, the possibility of these other infections and their systemic results must be borne in mind. Let us consider the clinical picture. The urethra will most likely appear nearly normal, as it seems after a time to recover fully from the effects of gonorrheal infection. The orifices, however, of Skene's glands remain red and pouting for many years after infection. The ability to see these orifices is very typical of chronic gonorrhea, as ordinarily they are practically invisible.

The orifices of the ducts of the Bartholin's glands are also red and visible. Ordinarily, one or both of these glands are found swollen. The cervix will present a variety of pictures, according to its condition before the infection, and the type of secondary infections which have occurred. It will always show, however, signs of chronic infection with some socalled erosions at the external os. The whole vaginal surface of the cervix will often show a petechial rash of a bright red color, resembling the tongue in scarlet fever. When this is present, some form of streptococcus can usually be isolated from the culture taken from the cervical canal. Often there are numerous socalled nabothian follicles, but these are likely due to the secondary infections, rather than to the gonococci. The character of the discharge is different in chronic gonorrhea from that in a recent gonorrheal infection. It is, even after a long period of time, more like a true pus, but it varies a great deal both in character and appearance, being modified by the secondary infections that take place. As time goes on, it tends more and more to become thick and mucoid in character. Thus we have a picture differing little from the nonspecific chronic endocervicitis, excepting for the changes in the discharge, which may be slight, and the involvement of Skene's glands and Bartholin's glands.

Laboratory work in a case of gonorrhea of one year's duration recently was as follows: Slides to the number of ten in two different laboratories showed some pus; no intracellular gram negative diplococci; quite numerous extracellular gram negative diplococci; cultures of colon bacillus and hemolytic streptococci; complement fixation test negative for gonococci; Wassermann test negative. Thus we see the extreme difficulty of diagnosing chronic gonorrhea in the female.

PROGNOSIS.

The prognosis is never as hopeful as could be desired. It depends upon, first, the virulence of the infection; second, the individual resistance of the patient; third, the type of secondary infection, and fourth, the method of treatment. There are many other factors that enter into the prognosis but these are certainly the main ones.

It is impossible to forecast in what percentage of cases severe tubal, joint, heart and systemic conditions will develop. It is likely that no patient escapes some tubal involvement, but many times the pathological disturbances are in time almost overcome, especially if early and active treatment of the cervical infection is carried out (Curtis) (8). It is seldom necessary to operate for pelvic conditions in the acute stage. There is, without a doubt, a permanent damage to the fallopian tubes, due either to the gonococcus or to some secondary infection in ninety per cent. of all women who have been infected with gonorrhea, and probably fifty per cent. of these patients eventually need operative treatment for pelvic disease. When we consider also the joint involvements and other systemic conditions which so frequently result from this disease, we can begin to realize the gravity of this infection in women.

In considering the prognosis in this disease we must also remember that the secondary infections which invariably follow gonorrheal infection in women, also have their own resultant pelvic as well as joint, systemic and mental involvement (Langstroth) (7).

Thus we see that gonorrhea in women is a disease fraught not only with many possibilities of immediate severe pathological changes in the pelvic and urinary organs, with or without accompanying arthritis and other complications, but also with grave late tubal, ovarian, joint, systemic and mental diseases.

TREATMENT.

The treatment must be considered from both the medical and the surgical points of view, in both the acute and the chronic stages of the disease. In its early stages it is still a local process, and any form of treatment which washes away the discharge and tends to destroy the specific organisms is of value. The difficulties are that the germs so soon become buried in the glandular tissues and spread by means of the lymphatics to other parts. Therefore local treatment even in the early stages of the diesase is not a means of curing it.

Copious vaginal irrigations with a solution of potassium permanganate, using one dram of the saturated solution to two quarts of water at about 118° F. twice a day are useful in the early stages. This is practically the old treatment recommended by Janet (15) and Valentine (16) for gonorrheal urethritis in the male. In addition, some form of colloid silver, or dye solution, should be applied to all accessible parts of the genitourinary tract every other day. I favor a twenty-five per cent. solution of argyrol gradually increased to fifty per cent. A bivalve speculum exposes the cervix and the solution carried on an applicator in the early stages only, to the external os, but later a fifty per cent. solution can be carried up to the internal os, in those cervices which are sufficiently patulous. As the speculum is withdrawn opened, the same solution is applied to all parts of the vaginal canal, Skene's glands and the ducts of the Bartholin's glands. The ureter should be injected with a five to ten per cent. argyrol or other suitable solution. Of course there are a vast number of drugs to choose from, and it is often well to vary the form of the application used.

Injections of either autogenous or stock antigonorrheal vaccine should be given. The patient's resistance should be kept at its best by careful attention to diet and hygiene and the proper use of tonics.

Intramuscular injections with one of the preparations of cacodylate of iron and strychnine are of value. Surgical treatment is confined in the acute stages to the relief of abscess of Bartholin's glands, pelvic abscess, pyosalpinx, and other complications.

It is now known that a large proportion of patients with tuboovarian and pelvic conditions occurring in the course of acute gonorrhea will get well with rest in bed and the use of the icebag and local treatment of the cervix. Thus operations in the acute stages of this disease are much less frequent than formerly.

RESULTS OF SECONDARY INFECTIONS.

Despite this method of treatment, gonorrhea in women will, after a period of six months, reach a chronic stage in which the symptoms are slight but persistent. The treatment demands the greatest patience and skill of the gynecologist. It is in the chronic stages that, due to the secondary infections invariably occurring in the cervix, any of the following conditions may arise: First, persistent and offensive leucorrhea from chronic infection of the cervix (and less frequently of Skene's glands); second, various menstrual disturbances (as dysmenorrhea, menorrhagia, and amenorrhea), resulting from pathological changes in the uterus and the ovaries. These changes have been described in the papers of Sturmdorf (1), Curtis (3, 8), and Langstroth (2, 4), and will not be detailed here. Third, arthritis, especially of the knee and ankle joints, and less frequently of the other joints (Lowsley) (14). This may occur either as gonorrheal arthritis, or as is more frequent in the chronic stage, as a result of the toxins absorbed from the cervix which has become the site of a focal infection due to the various organisms which are found to follow gonorrheal infection. Fourth, various nervous mental and systemic conditions may result. These have been described in a previous paper (Langstroth) (7).

LIMITATIONS OF MEDICAL TREATMENT.

The treatment of chronic gonorrhea in women can readily be seen to resolve itself into the application of such measures as will remove the areas of chronic foci of infection and restore the parts to as nearly normal a condition as possible. The field of medical treatment in this stage is certainly limited, as far as actual permanent cure is concerned. The results of x ray applications, radium and cautery in these cases are unreliable, uncontrollable and uncertain in their action. They also necessitate a much longer period of morbidity and loss of time than surgical measures would involve. The use of radium and the x ray in these conditions may be the cause of serious consequences if it becomes necessary later to operate for pelvic complications. This fact has been pointed out by Graves (17) and Langstroth (18). Deaver deserves the greatest credit for his timely warning against the use of radium and the x ray in cancer, as a curative agent.

SURGICAL TREATMENT.

Surgery offers the only promise of a cure in these cases. There is, however, no surgical field in which the operative work must be carried out with more delicacy and skill, if the functions of the generative system are to be preserved. In these chronic cases, with their accompanying secondary infections, the primary foci from which all the other conditions arise is, as has been stated, the endometrium of the cervix from the external to the internal os. It is here that the serious menace to the future health and happiness of the patient exists. Second, Skene's glands, and third, the Bartholin's glands. It is to these foci primarily, and to the pelvic conditions secondarily, that surgical methods must be directed. It is poor surgery and wrong to do pelvic operations in these cases and not remove these areas of infection.

In fact, as has been previously pointed out by me and confirmed by the findings of Curtis (8), the tubes and ovaries are capable of marked regenerative changes, especially in gonorrheal infections, if the source of primary infection is removed early.

To be able to decide when pelvic surgery is or is not indicated in these cases demands skill and judgment, since with the infection removed from the cervical canal many tubes and ovaries can be saved that had formerly to be sacrificed.

Before surgical work is attempted on gonorrheal patients the following conditions should be met (these, of course, do not apply to the surgical conditions that arise during the acute stage): Six months to one year should have elapsed since the last gonorrheal infection occurred; the typical gram negative intracellular diplococci should have disappeared from the cervical smears, and an intensive treatment of local applications of colloid silver should be carried out three times a week for three weeks prior to the operation.

The surgical procedures to be carried out are the removal of the involved Bartholin glands; the elimination by cautery or knife of the diseased Skene's glands: the complete removal of the cervical endometrium from the external to the internal os, with careful relining of the cervical canal with a flap from the vaginal surface of the cervix; and the reremoval of such portions of the adnexa as shall be determined to be hopelessly diseased and are acting as a secondary foci of infection.

If such surgical work is carefully carried out, I believe that fully ninety-five per cent. of these patients are made, not only noninfectious, but that their health will be restored, and in a majority the procreative function will be preserved.

CONCLUSIONS.

Gonorrhea in women is not confined to any one strata of society, and is rapidly increasing in frequency.

The gravity of this disease is not appreciated as fully as it should be.

The diagnosis is often difficult, and is frequently confused with chronic nonspecific infections of the cervical mucosa.

Gonorrheal infection of the cervix is always followed by secondary infections, which are often the cause of severe systemic and mental disturbances.

Surgical removal of Skene's glands, Bartholin's glands, and the cervical endometrium is the only way in which the disease can be eradicated in the majority of cases.

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The references will appear in the author's reprints.

Ovarian Therapy in Involutional Melancholia*

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INTRODUCTION.

More interesting and possibly more usual than dysfunction of individual units of the endocrine apparatus are the symptomatic expressions which may be the possible result of a disturbance of the balance and interdependence which exists between the various ductless glands. In this connection the gonads are particularly important. It has been held for some time that the eunuch presents a psychophysical anomaly, due, at least in part, to the secondary pituitary activity which follows ablation of the gonads. The relationship between the thyroid and the gonads rests on a less secure foundation, but the hypothesis, at least, is reasonable enough to merit clinical investigation. For instance, it is thought that during the postmenstrual period when the corpora lutea are being formed, the thyroid is relatively inactive. With the approach of the next period, the luteal activity is distinctly lessened, and with the consequent reduction of inhibitory control, the thyroid may become overactive and the physical and mental phenomena which are so commonly associated with the immediate premenstrual stage are produced. Again, the balance is restored by the production of fresh luteal secretion. "However, when, through nonactivity of the ovary—at the menopause for instance—this is not the case, then the persistent thyroid, uncompensated by luteal secretion, produces many of the symptoms of this state. The paresthesiæ, sleeplessness, nervousness, irritability, cardiac arrhythmia, vasomotor disturbances, and profuse sweating of this condition are well known; and are in all probability due largely to thyroidal disturbance. The increased blood pressure seen frequently at this time is due to the sensitization of the neuromuscular synapse to adrenalin by the thyroid activity. If this adrenalin content is deficient, then we get intense weakness, asthenia, and collapse. The administration of ovary at this time offsets this thyroid activity and often brilliant results follow in the alleviation of the annoying conditions produced by it. The relation of the thyroid to the gonads is also strikingly shown in the increased rapidity of sexual development under its influence. In amenorrhea, or in delayed and scanty menstruation, thyroid administration is effective" (1).

Several years ago, while investigating a group of late psychoses in women from the angle of catatonia (2), one of the writers was somewhat impressed by the apparent resemblance of certain elements of the psychotic content in socalled involutional melancholia to the mental state which commonly obtains at the climacteric and has been rightly or wrongly regarded as physiological. Indeed in given instances there seemed to be between the normal menopause and the psychosis merely a symptomatic difference in degree, but scarcely in kind. Thus, at times, the not unusual concomitants of the climacteric such as feelings of jealousy, abrupt emotional oscillations, light depressive states, impulsive behavior, pronounced irritability, restlessness, and numerous subjective hypochondriacal sensations were seemingly replaced in the outspoken attack of mental disease by strong delusions of jealousy, a deep depressive coloring, frequent outbreaks of angry irritability, restless agitation, and somatic delusions. However, one is not naive enough to believe that there is necessarily a direct connection between the psychopathology and metabolic toxicity of the physiological (?) climax and involutional depression, nor does one have the requisite amount of endocrinological optimism to attribute the varied symptoms of the epochal psychosis solely to the effect of unopposed thyroid secretion. It is more reasonable to assume that the steps which are taken in the genesis and development of the psychosis are too immensely complicated to admit of such a simple explanation. Nevertheless, it is probable that endocrine imbalance is a factor of some importance and deserves careful consideration. From such a point of view, the following relatively simple clinical therapeutic experiment was carried out.

CONDITIONS OF THE EXPERIMENT.

This experiment consisted in the intramuscular injection of the contents of an ampoule of corpus luteum and one ampoule of ovarian substance on alternating second days, so that each was repeated every fourth day for three months. Fourteen fairly typical cases of involutional melancholia were utilized. Careful detailed notes were kept before, during, and after the course of medication. Observations of physical conditions were noted as follows:

Daily: Pulse, temperature, respiration, bowel movements, and sleep in hours. Every third day: Blood pressure. Weekly: Uranalysis, weight. At irregular intervals: Appetite, skin, and menstrual changes. At beginning and ending: Complete blood count.

Miscellaneous notes are made when indicated. Mental changes were recorded every week as follows: Agitation, motor activity, occupational interest, cooperation, delusional formation, insight, suicidal tendencies, reaction to food, and miscellaneous.

DESCRIPTION OF PATIENTS PHYSICALLY BEFORE EXPERIMENT.

It seems desirable to make a brief statement of the physical status of each of the fourteen patients as recorded before any medication was started.

CASE I.—Married, aged sixty-one, moderately well nourished. Physical examination negative; average pulse 74, temperature 97.4°, respiration 18; blood pressure, systolic 130, diastolic 82; uranalysis negative; bowels regular; sleep average six hours; appetite poor; skin normal; no menstruation; weight 111 pounds; blood count: red blood cells 4,800,000, while blood cells 10,250, hemoglobin 95 per cent., eosinophiles 0.[1] The general condition was otherwise normal and fairly good.

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* Read at the stated meeting of the Philadelphia Psychiatric Society, March 10, 1922, at the College of Physicians, Philadelphia.

Case II.—Single, aged sixty-two, fairly well nourished, some fibrosis at base of right lung; slight fine tremor of hands; average pulse 80, temperature 98.4°, respiration 20; blood pressure: systolic 135, diastolic 84; uranalysis negative, bowels constipated, sleep average six hours, appetite fair, skin moist and sallow, no menstruation, weight 125 pounds; blood count: red blood cells 3,700,000, white blood cells 8,000, hemoglobin 85 per cent., eosinophiles 0 per cent. The general condition was good.

Case III.—Widow, aged fifty-two, poorly nourished, physical examination negative, pulse 92, temperature 98.6°, respiration 22; blood pressure: systolic 140, diastolic 94; uranalysis negative, bowels regular, sleep average seven and a half hours, appetite fairly good, skin normal, no menstruation, weight 97 pounds; blood count: hemoglobin 95 per cent, red blood cells 5,100,000, white blood cells 12,600, eosinophiles 3 per cent. General condition fair.

Case IV.—Married, aged sixty-four years, fairly well nourished, slight exophthalmus, scar from thyroidectomy base of neck anteriorly, pulse 68, temperature 98.2°, respiration 18; blood pressure: systolic 168, diastolic 106, uranalysis negative, bowels regular, sleep average five hours, appetite good, skin normal, no menstruation, weight ninety-seven and three-quarters pounds; blood count: hemoglobin 100 per cent., red blood cells 5,000,000, white blood cells 10,000, eosinphiles 1 per cent., general condition good.

Case V.—Single, aged sixty years, greatly emaciated, physical examination negative, pulse 82, temperature 98.2°, respiration 20; blood pressure: systolic 160, diastolic 99; uranalysis: transient albuminuria, appetite good, skin normal, no menstruation, weight sixty-eight and one half pounds; blood count: hemoglobin 95 per cent., red blood cells 4,200,000, white blood cells 10,500, eosinophiles 2 per cent., general condition fair.

Case VI.—Single, aged fifty-three years, poorly nourished, physical examination negative, pulse 76, temperature 98, respiration 18; blood pressure: systolic 120, diastolic 78; uranalysis: transient albuminuria, bowels regular, sleep average eight hours, appetite fair; skin: sallow and cool, no menstruation, weight 109 pounds; blood count: red blood cells 4,500,000, white blood cells 7,000, hemoglobin 85 per cent., eosinophiles 0 per cent., general condition fair.

Case VII.—Married, aged forty-eight years, well nourished, scoliosis with deviation to the right, irregular heart action, prolapsed and retroverted uterus and cystocele, pulse 68, temperature 98.2°, respiration 18; blood pressure: systolic 99, diastolic 64, uranalysis negative, bowels loose, sleep average eight hours, appetite fair; skin: pale, then flushed when irritable, menstruation regular, caused agitation, irritability and other symptoms, weight 106 pounds; blood count: hemoglobin 90, red blood cells 4,370,000, white blood cells 7,600, eosinophiles 0 per cent., general condition fair.

Case VIII.—Widow, aged fifty-three years, well nourished, palpable thyroid, slight exophthalmos, mild myxedematous skin changes, pulse 74, temperature 97.6°, respiration 18; bowels regular, sleep seven hours, appetite good; skin: blotched flushing, no menstruation, weight 139 pounds; blood count: hemoglobin 100 per cent., red blood cells 4,380,000, white blood cells 10,300, basophiles 4 per cent., eosinophiles 3 per cent., general condition good.

Case IX.—Widow, aged fifty-one, poorly nourished, physical examination negative, pulse 78, temperature 98.2°, respiration 18; blood pressure: systolic 148, diastolic 90; uranalysis: transient albuminuria, low specific gravity, hyaline and granular casts, bowels regular, sleep average eight hours; appetite: forcibly fed with spoon, skin normal, no menstruation, weight ninety-nine and three quarter pounds; blood count: hemoglobin 90 per cent., red blood cells 3,840,000, white blood cells 8,200, eosinophiles 1 per cent., general condition fair.

Case X.—Single, aged fifty-one, poorly nourished, physical examination negative, pulse 86, temperature 98.6°, resiration 24; blood pressure: systolic 128, diastolic 94, weight 115 pounds, uranalysis negative, bowels regular, sleep average eight hours, appetite good, skin normal, no menstruation; blood count: hemoglobin 80 per cent., red blood cells 4,800,000, white blood cells 10,000, eosinophiles 5 per cent., general condition fair.

Case XI.—Married, aged sixty-three years, poorly nourished; exophthalmos, moderate arteriosclerosis, pulse weak, irregular, 96, temperature 98.2°, respiration 22; blood pressure: systolic 148, diastolic 95, weight eighty-five pounds; uranalysis: low specific gravity, transient albuminuria, hyaline and granular casts, bowels regular, sleep six and one-half hours; appetite: tube fed; skin: face flushed, no menstruation; blood count: hemoglobin 100 per cent., red blood cells 5,000,000, white blood cells 8,800, general condition very poor.

Case XII.—Married, aged fifty-four years, undernourished, moderate arteriosclerosis, pulse 74, temperature 98, respiration 18; blood pressure: systolic 150, diastolic 99; uranalysis: transient albuminuria, bowels constipated, sleep average eight hours, appetite fair; skin: rough and oily, no menstruation, weight 111 pounds; blood count: hemoglobin 80 per cent., red blood cells 4,100,000, white blood cells 7,600, eosinophiles 2 per cent., general condition fair.

Case XIII.—Single, aged fifty-six years, undernourished, hemorrhoids, irregular tremors of hands, rheumatoid arthritis; blood pressure: systolic 160, diastolic 99; uranalysis: transient albuminuria, bowels regular, sleep average four hours, appetite fair; skin: brown pigmentation, pale about mouth and nose, no menstruation, weight 110 pounds; blood count: hemoglobin 85 per cent., red blood cells 4,200,000, white blood cells 8,800, eosinophiles 2 per cent., general condition fair.

Case XIV.—Married, aged fifty years, well nourished, physical examination negative, pulse 74, temperature 98.4°, respiration 20; blood pressure: systolic 128, diastolic 88; uranalysis: trace of albumin and occasional casts, bowels regular, sleep five hours; skin: flushing, no menstruation, weight 131 pounds; blood count: hemoglobin 85 per cent., red blood cells 4,100,000, white blood cells 8,500, general condition good.

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[1] Eosinophilia only is recorded as the eosinophiles were the only white blood cell constituent which underwent notable change.

The blood Wassermann was negative in all fourteen cases.

MENTAL CONDITION OF PATIENTS BEFORE THE EXPERIMENT.

To give a detailed description of the mental condition of the fourteen patients who were studied would add unduly to the length of this presentation. It will suffice to enumerate the prominent symptoms which were displayed.

CASE I.—Onset at fifty-five, duration five years, five months, depressed, selfaccusatory, worried, apprehensive, irritable, suspicious, ideas of reference, delusions of persecution, hallucinosis, somatic delusions, restless, agitated.

CASE II.—Onset at sixty-one, duration six months, depressed, suicidal, irritable, hypochondriacal, somatic delusions, restlessness, agitation, resistiveness. "Nervous prostration" at forty-five.

CASE III.—Onset at fifty, duration two years, two months, depressed, selfaccusatory, apprehensive, irritable, confused, hypochondriacal, somatic delusions, depressive delusions, delusions of poverty, restless, agitation, destructiveness, resistive, violent.

CASE IV.—Onset at sixty-one, previous attack at forty-nine, duration two years, five months, depressed, selfaccusatory, apprehensive, irritable, restless, agitated, episodic violence, destructiveness.

TABLE I

SUMMATION OF PHYSICAL OBSERVATIONS

Case number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	*Totals* +	—
PHYSICAL OBSERVATIONS:																
Pulse (daily)	+10	0	0	+8	0	0	0	+6	0	0	0	0	—8	0	3+	1—
Temperature (daily)	+1^{2}°	0	0	0	0	0	0	+1^{2}°	0	0	0	0	—½°	0	2+	1—
Respiration (daily)	0	0	0	+4	0	0	0	0	+6	0	0	0	—4	0	2+	1—
Blood pressure (every third day):																
Systolic	0	—10	—10	—30	—20	—5	—15	0	—20	+10	—30	—15	—10	—10	1+	11—
Diastolic	—15	—15	—10	—15	—20	—5	—20	—10	—20	—10	—10	—15	—15	—15	0+	14—
Urinalysis (weekly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bowels (daily)	0	+	0	0	0	0	+	0	0	0	0	0	0	0	2+	0
Sleep (hours a night)	+	+	0	0	0	0	0	0	0	+	+	0	+	+	6+	0
Appetite (gauge)	+	+	+	0	0	0	0	0	+	0	+	+	0	0	6+	0
Skin changes (note)	0	+	0	0	0	+	0	0	0	0	0	+	+	+	5+	0
Menstrual signs (note)	0	0	0	0	0	0	+	0	0	0	0	0	0	+	2+	0
Weight—pounds (weekly)	+2½	0	+8	+3¼	+2	+3	+3¾	+4½	0	+11	—5	+3¼	+3¾	0	10+	1—
Blood examination:																
Hb.					—	+		—		+	—		—		1+	4—
R. B. C.					—	—		+	+		—				1+	3—
W. B. C.						+	+			+					3+	0
Eosin.	+4%	+2%		+2%		+4%	+4%	+4%		+7%	+1%				8+	0

In columns headed Totals is indicated number of cases showing + or — results.

CASE V.—Onset at fifty-four, duration four years, seven months, depressed, selfaccusatory, suicidal, irritable, hypochondriacal, somatic delusions, restlessness, agitation, resistiveness.

CASE VI.—Onset at fifty-one, duration eighteen months, recovery, worried, depressed, suicidal, hypochondriacal, somatic delusions, hallucinating (?), agitated, restless.

CASE VII.—Onset at forty-seven, duration one year, depressed, selfaccusatory, irritable, poverty delusions, agitated.

CASE VIII.—Onset at fifty-one, duration three years, worried, depressed, irritable, apprehensive, suspicious, ideas of reference, persecutory delusions, somatic delusions, depressive delusions, visual hallucinosis (?), restless.

CASE IX.—Onset at forty-eight, duration two years, three months, depressed, selfaccusatory, worried, apprehensive, confused, restless, agitated, resistive.

CASE X.—Onset at forty-nine, duration twenty months, worried, depressed, selfaccusatory, irritable, manic traits, depressive delusions, restless, agitated, resistive, impulsively violent, destructive.

CASE XI.—Onset at sixty-two, duration sixteen months, previous attack at forty-three (one year), worried, depressed, suicidal, selfaccusatory, apprehensive, irritable, confused, depressive delusions, paranoid ideas, somatic delusions, restless, agitated, resistive.

CASE XII.—Onset at fifty-two, duration two years, three months, recovery, worried, depressed, selfaccusatory, hypochondriacal, apprehensive, suspicious, hallucinated, depressive delusions, somatic delusions, confused, restless, agitated, resistive.

CASE XIII.—Onset at fifty-four, duration three and a half years, worried, depressed, selfaccusatory, suicidal, irritable, apprehensive, hypochondriacal, restless, agitated, somatic delusions, impulsive, resistive, violent.

CASE XIV.—Onset at forty-seven, duration three and a half years, depressed, selfaccusatory, worried, irritable, restless, agitated.

STATEMENT OF PHYSICAL RESULTS.

Physical changes occurring in each case during the three months of this experiment may be more easily understood by referring to the accompanying chart which indicates results studied by comparing averages of first two weeks with those of last two weeks, and taking into consideration any definite findings noted throughout course of medication. (Table I.)

SUMMARY OF FOURTEEN CASES.

Pulse rate.—A persistent increase was shown in three and a decrease in one.

Temperature.—A rise of 1.2° was maintained in two and a fall of 5° in one case.

Respiratory rate.—This was increased slightly in two cases and decreased in one.

Blood pressure.—Diastolic pressure fell in all fourteen cases from five to twenty mm. of mercury, systolic fell in eleven cases from five to thirty mm. of mercury, in two cases there was no change and in one an increase of ten mm. of mercury.

Uranalysis.—No definite change was shown in urine. Several transient albuminurias were noted, but all of these had had previous similar findings.

Bowels.—Changes were noted in two cases; one patient with obstinate constipation gradually returned to normal daily movements, another with a persistent diarrhea also returned to her normal routine.

Sleep.—In six cases a gradual definite improvement was manifested in quality and quantity of sleep.

Appetite.—This gained steadily in six cases, one from tube feedings to a ravenous eater, and another from spoon feeding to a gormandizer.

Skin changes.—Changes in the skin occurred in five cases. These were recorded as those patients whose skin after being rough and oily, having areas of flushing and blanching, etc., returned to a normal condition.

Menstrual changes.—These were noted in two cases. In one normal menstruation became established during the last month of therapy after an absence of seventeen months. In the other case the periods became shorter and less troublesome from the viewpoint of irritability, pain, and general discomfort. All the other patients were past the climacteric.

Weight.—There was an increase in weight in ten cases from two to eleven pounds, while one patient lost five pounds and three showed no change.

Blood examinations.—These examinations were inconstant in showing results, except that the hemoglobin decreased in four and increased in one; red blood cells decreased in three and increased in one; white blood cells increased in three cases. In the differential count, it was noticed that in eight cases there was an eosinophile increase from one per cent. to seven per cent. above their former examinations. In three cases the blood picture remained practically unchanged.

Since the most constant change was in the blood pressure, a chart (Chart I) is presented, which shows the average change which occurred in the systolic and diastolic readings.

STATEMENT OF MENTAL RESULTS.

It is never a simple matter to estimate even with approximate accuracy the direct effect of an isolated therapeutic agent. The difficulty is greatly increased when one is considering improvement or the reverse in the mental symptoms. There is a margin of error which cannot be eliminated. The most serious error to be considered is the natural tendency of a benign psychosis to reach a favorable issue. Furthermore, as is well recognized, there may be various temporary shiftings in the position of this or that symptom which may for an interval alter the complexion of the psychosis. With these reservations we may attempt to briefly discuss the changes which appeared in the mental aspect of our patients.

Case I.—In this patient there was definite improvement which amounted to practically a social recovery. After a two and a half months' period of hospital treatment, she was able to return to her home and successfully resume satisfactory relations with her family and the active care of her household. Motor activity dropped to a normal level; the emotional tone and the delusional formation which it colored are not now in evidence; cooperation in the matter of occupation and food was excellent when she left the hospital. One cannot be certain either that the hallucinosis has entirely disappeared or that there is clear insight.

Case II.—Only received six injections. Considerable improvement was present before the medication was used, the slight restlessness which still remained soon disappeared and the patient is now doing well at home.

Case III.—There was no improvement.

Case IV.—In this patient the motor activity is at a lower level; the outbreaks of episodic violence are somewhat less frequent. The most important gain has been a broadening of interest in the direction of occupation. The emotional tone is not modified to any extent.

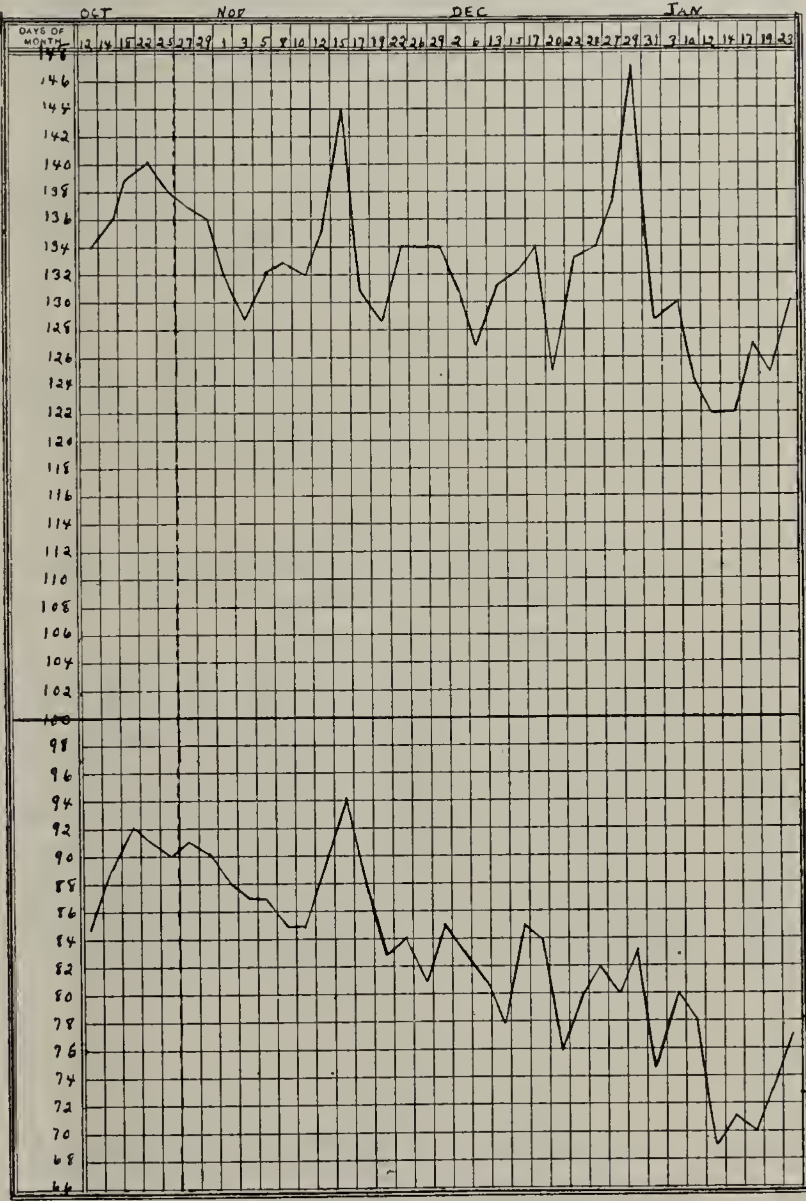

Chart 1.—Blood pressure averages, upper tracing systolic, lower diastolic. Medication was started on October 27th.

Case V.—There was not enough change to constitute an improvement.

Case VI.—After ten months' hospital treatment, this patient was able to return to her home markedly improved. Her motor activity was much lessened; her suicidal tendencies disappeared and she attained a fairly satisfactory affect level.

Case VII.—In this patient there has been consistent improvement. Depression is still present, but it is more accessible to environmental stimuli and lost its irritable ironic aspect. With the broadening of contact with reality there has appeared increasing interest in occupation and occasional initiative.

Case VIII.—Beyond a moderate lessening of motor activity, there has not been any improvement.

Case IX.—Here there may be recorded only a minor reduction of pathological activity with somewhat less rigid resistiveness.

Case X.—This patient is less deeply depressed; she is more in touch with her surroundings and is more cooperative and her range of interests is wider.

Case XI.—In this rather extreme example of an involutional psychosis, the periods of severe apprehensiveness, agitation, and depression have decreased in frequency. Her insight, though still in a vague and uncertain state, is beginning to appear.

Case XII.—The patient was able to return to her home after a period of six months. Now she is aparently entirely well with the exception of a tendency to insomnia and a few subjective sensations.

Case XIII.—Although this patient cannot be listed as a recovery, she did show enough improvement to justify a trial visit to her home. Both the emotional tone and its concomitant motor expression gradually became less pronounced; the somatic delusions were favorably modified and partial insight was acquired. The period of hospital treatment was ten months.

Case XIV.—This patient will probably soon be able to leave the hospital. The depression is disappearing; the restlessness is under control; there is more initiative, and particularly, there is the development of insight.

SUMMARY.

The most important and definite physical changes resulting from this experiment may be briefly summarized as follows:

All fourteen patients showed a drop in diastolic blood pressure and in eleven patients a drop in systolic pressure; ten patients gained in weight, six improved markedly in appetite, six showed improvement in quantity and quality of sleep, one reestablished menstruation after an absence of seventeen months, in one there developed a decided improvement in troublesome menstrual manifestations, and eight showed rise in the percentage of eosinophiles. No one patient is any worse than before medication started and there is a noticeable improvement in the general physical condition of the group as a whole.

It is somewhat difficult to discover adequate terms with which to express comparative degrees of mental improvement. From the social viewpoint which implies sufficient amelioration of symptoms and the resumption of enough contact with reality to make family and community life feasible, six of our patients may be said to have made a recovery. However, since some connection between the experimental medication and the present status of the patients is implied, two of them must be eliminated from the statistics. In one instance, the injections were given only a few times and in the other we must be somewhat skeptical regarding the probable endurance of even the qualified recovery. There remain four patients who remarkably improved after an average hospital treatment of seven and a half months. Four additional patients showed definite improvement and finally there were four in whom only minor favorable changes or none at all could be noted.

CONCLUSIONS.

Although no definite connection between any of the symptoms of socalled involutional depression and ovarian function has been determined, it seems probable that in a limited number of patients the injection of ovarian extracts exerts a favorable influence on the general physical status and perhaps more particularly it lowers and stabilizes the blood pressure, while possibly in a small group a corresponding helpful influence is exerted on the course of the psychosis.

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4401 Market Street.

One Hundred Cases of Postpartum Hemorrhage*

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Bleeding from the uterus after childbirth being almost of constant occurrence, the term postpartum hemorrhage is to some extent an arbitrary designation. It is difficult, therefore, to estimate the frequency of this complication with reasonable exactness. In the present report, definite cases of excessive bleeding from the uterine cavity have been selected to the number of one hundred. These are representative of 4,200 consecutive deliveries in the service of the Berwind Maternity Clinic and in private cases. The ratio of one case of postpartum hemorrhage to forty-two labors compares with the incidence of one in fifty-eight reported by Rice at the Manhattan Maternity Hospital.

Various observers, notably Ahlfeld, have made routine measurements of the amount of blood lost after labor and found that from three to five hundred c. c. represents about the normal loss; that much larger quantities may be lost without symptoms; and that, in exceptional cases, as much as four litres of blood have been lost without fatal result. Since women react to hemorrhage in varying degrees, and since death has frequently followed hemorrhage of one litre, quantitative determinations become of academic importance, as no wise attendant in a case of parturition will permit bleeding amounting to litres. Moreover, it has happened frequently in our series that a threatening hemorrhage which impelled radical measures for its arrest eventually amounted to a smaller total loss of blood than a slow protracted case in which less heroic methods were at first deemed sufficient.

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*Read at a meeting of the Yorkville Medical Society, May 15, 1922.

Among the one hundred cases of hemorrhage there were twenty-one primiparæ and seventy-nine multiparæ; this was about the proportion of parity in the service. In twenty-two cases there was concomitant retained or adherent placenta. There was one death in a case of hemorrhage with adherent placenta. In this case, a secundipara who had had a protracted but spontaneous labor, shock developed following moderate bleeding and when this was arrested no attempt was made to remove the placenta. Fifty-one labors terminated spontaneously, while forty-nine required some form of assistance. The latter consisted of seventeen cases of podalic version, sixteen applications of forceps, four breech extractions, and four cases of assisted twin births. Version was performed for the following indications: two for prolapsed cord, four for placenta prævia, one for transverse presentation, six for unengaged head in occiput posterior position, and four for the termination of induced labor. Induction of labor was done in two cases for prolonged gestation, in one for chronic nephritis, and in one for endocarditis with contracted pelvis. Six patients presented possible predisposing causes for hemorrhage: one had endocarditis, three had nephritis, and two experienced hemorrhage after spontaneous premature labor. Personal notice of individual predisposition was had in seven patients; of these six had the complication with two successive labors, and one with three successive labors. The ages of the patients in the whole series ranged from fourteen to fifty-four, but no conclusions as to predisposition on account of age could be drawn.

That the duration of labor influences the occurrence of postpartum hemorrhage is known. It has not been feasible to tabulate the length of labor in the several thousand cases for the purpose of comparison. Beside, the onset of labor in many cases being indefinite, the duration of labor cannot always be determined. Some conclusion may, however, be justified from the observation that although in only fifteen per cent. of all cases was interference required, this class contributed fifty per cent. of the hemorrhages. Since, general speaking, these patients had been a longer time in labor, and since bleedings from lacerations are not here considered, these having never been excessive, it may be stated that prolongation of labor, *per se,* did prove an important factor in the causation of postpartum hemorrhage. In this connection some allowance may be required for the effect of anesthesia, but this was generally counteracted by the administration of pituitary extract immediately prior to or soon after the termination of the second stage.

Essential inertia uteri was given in a number of cases as the only etiological factor. The exact number could not be depended upon, because this condition can only be ascertained after exclusion of all other abnormalities. Although inertia is attributed to various diseases of the mother, undoubted cases of primary inertia have been seen in apparently healthy women. Inertia is often associated with adherent placenta and this combination is not amenable to treatment with pituitary or ergot.

A number of cases of postpartum hemorrhage are caused or accentuated by faulty management of the last stages of labor, such as rapid extraction of the fetus or second twin, by excessive manipulation of the fundus uteri before complete separation of the placenta, by premature attempts to express the placenta, by failure to hold down the fundus after its expulsion, and last but not least, by abandoning the uterus with retained blood clots or placental remnants. In regard to retained portions of placenta, the most careful inspection failed in several instances to disclose any missing parts, though these became evident subsequently by their spontaneous passage or by manual removal in the course of revision of the uterine cavity in cases of postpartum fever. This elusiveness has led to the conviction that accessory placentæ are more common than is usually believed. Six cases of retained placental tissue came to notice in the records, but as in many instances they are passed spontaneously without further ado, the actual number was undoubtedly much greater. In one of these six cases hemorrhage followed the placenta, in two cases bleeding took place when the patient left the bed, two exhibited fever without excessive bleeding, and one had an otherwise uneventful puerperium.

That hemorrhage may occur after easy labors is borne out by four cases in precipitate labor. Two of these were ascribed to delay in arrival of attendant.

DEATHS FROM POSTPARTUM HEMORRHAGE IN THE UNITED STATES.

The reports on vital statistics of the United States Bureau of the Centsus are worthy of study in estimating the death rate from hemorrhage following childbirth. In the year 1919 there were reported from the registration area 14,488 puerperal deaths. These included deaths from pregnancy. The rate for each thousand living births was 7.4, an increase over the year 1915 of 1.3 to the thousand living births. The largest number of deaths, about one third, was ascribed to sepsis; the next largest toll was exacted by the toxemias which caused 3,592 deaths; there were 1,175 deaths ascribed to postpartum hemorrhage, a rate of 0.6 to the thousand living births. There is another group of deaths accounted for by the heading Other Accidents of Labor, with 2,087 deaths. It seemed that the number of deaths ascribed to hemorrhage is smaller than the actual number, and that the more than two thousand deaths given under other accidents of labor are in reality in large measure deaths caused by hemorrhage. Upon inquiry at the bureau as to what constitute the chief causes of death listed under Other Accidents of Labor a list was returned which contained no less than fifty certifications, but the four most important causes given were: Childbirth (without further qualification), difficult labor, instrumental delivery, and Cæsarean section. It is evident that the first three conditions given cannot in themselves explain so many deaths and that in a large number of these cases hemorrhage was the chief contributing factor.

PROPHYLAXIS.

The prevention of postpartum hemorrhage depends in large measure upon the proper management of labor. In given cases what appears to be the better management of the labor enhances the chances of subsequent hemorrhage. In most difficult labors one finds it advisable to allow ample time for Nature to take its course, to the end that the os become sufficiently dilated and a maximum degree of moulding of the head enable engagement. Premature interference is a greater danger to the child than undue prolongation of labor, in most cases, and subjects the maternal soft parts to greater liability to injury. It follows that exercise of conservatism, which is exceedingly desirable in these cases, may cause uterine exhaustion and requires the anticipation of, and the preparation for coping with, a postpartum hemorrhage. This complication should, however, be responsible for very few, if any, maternal deaths. Without assumption it may be stated that from the viewpoint of conservation of maternal life postpartum hemorrhage occupies, potentially, first rank in obstetrical prophylaxis.

A certain number of hemorrhages can be avoided by proper management of labor. While time is the most efficient factor in obstetrics labor is often allowed to become unreasonably prolonged through the oversight of some minor abnormality. One which is not commonly emphasized is abnormality of the bag of waters. Absence or scant amount of liquor amnii is a condition not infrequently met with, especially in primiparæ. This condition, aside from failing to assist the dilatation of the cervical os, hinders the efficiency of the uterine contractions and delays descent and moulding of the head. A similar negative effect is produced by excessive liquor amnii, which tends to keep the presenting part floating, and the uterine muscle overdistended. Recognition of these minor abnormalities and their proper management will shorten the duration of labor in these cases and thus prevent exhaustion of the uterus. Provided that the cervix is totally effaced and the os dilated to at least two fingers, delayed labor caused by excessive liquor amnii may be favorably benefited by rupturing the amniotic sac. In the case of absence of liquor amnii the same procedure may be employed or a hydrostatic bag introduced.

Although the administration of pituitary extract before the conclusion of the second stage is being discouraged of late and extensive experience with this product has revealed its limitations and its capability to create unpleasant situations, when given at the wrong time or in excessive doses, it is difficult to overlook its advantages in well selected cases and in moderate doses. While one c. c. is usually given after the birth of the child three tenths c. c. should be the maximum dose during the second stage. The third stage has been found to be shortened when pituitary extract is injected immediately after the birth of the child, but this seems to be true only in cases of normal third stage, for often it fails entirely to bring about the separation and expulsion of the placenta when the latter is pathologically adherent or in the presence of true inertia uteri. The administration of pituitary extract at the end of the second stage of labor is, therefore, in a sense a test as to the probability of eventual spontaneous birth of the placenta. When the latter fails to come away thirty minutes after the injection of one c. c. of pituitary extract of proved potency, it is an indication that the placenta remains adherent. In such event one will guide himself according to the amount of bleeding. The fundus uteri should be held gently while the placenta is still attached. This is designed for the prevention of a large retroplacental hematoma or filling up of the uterine cavity with blood, but not to promote contraction of the uterus. Ahlfeld and those adhering to his rule do not attempt to aid expulsion of the placenta for a period of two hours, unless there is hemorrhage. This seems an expenditure of time out of proportion to its benefits, as in many cases Credé expression becomes necessary in the end. A reasonable rule is that no expression be attempted until there is evidence of complete separation. Numerous signs of separation are described by various authors, the most dependable being: flattening of the fundus in the anteroposterior diameter; a gush of blood from the uterus; increased mobility with assumption of a globular shape by the fundus during the contraction period. Subjectively, the patient often complains of slight pain across the suprapubic region, and there is tenderness on pressure over the fundus.

After expulsion of the placenta the fundus is held down firmly for from thirty to forty-five minutes, and is then left to its own resources for a probationary period of about ten minutes. At the end of this period the fundus is compressed in Credé fashion and if any clots or an appreciable quantity of blood comes out it is a sign that the uterus is not yet capable of maintaining its retractibility and must be supported for another period of ten to twenty minutes, depending upon the quantity of blood expressed. It is erroneously believed that a hard fundus precludes the probability of hemorrhage when as a matter of fact it often denotes free blood in the uterine cavity.

Important as all the precautions for the prevention of postpartum hemorrhage may appear, the accident is liable to complicate labor in spite of strict observance of all the established rules of procedure. The management of this complication assumes, therefore, paramount importance.

TREATMENT.

Whenever there was persistent bleeding in spite of adoption of the measures outlined above, and the amount of blood lost was considered as approaching the threshold of danger, resort was had to tamponade of the uterine cavity, cervix and vaginal canal. In a number of cases, where there was procrastination in the belief that packing might be avoided, the patients went into alarming shock and required considerable effort to bring them around. For some reason most descriptions of the treatment of postpartum hemorrhage proceed to enumerate a series of methods for coping with this accident, and advise last of all packing. From the number of tentative measures advised it is evident that none of them is dependable. But most authorities agree that packing is quite reliable in arresting bleeding from the uterus, and, as the evidence points not only to its efficacy but also to the safety of this procedure, there is no motive in temporizing with less efficient means. Some failures have been reported but the technic has not been uniform. Some have made use of insufficient gauze, others were content to pack only the cervix and vagina, while still others attempted to apply tampons against the placental site. Those who practiced routine tamponade of the whole tract, like Grandin and Jarman, have nothing but praise for the procedure. The operation of tamponing was performed forty-seven times in the present series. It has not failed to arrest hemorrhage in a single instance, and repacking has never been necessary. In only one case was packing followed by a serious complication, phlegmasia; this occurred in a primipara with uterus unicornu, who had also had the placenta removed manually.

The simplest equipment found suitable and finally adopted for the performance of tamponade consisted of one glass tube twelve inches long, two inches in diameter, filled with a ten yard gauze bandage, six inches wide; and a tubular uterine packer, one commonly known as rapid packer, half an inch in diameter, which will allow the passage of gauze of the width mentioned. The use of the instrument and the width of the gauze present certain advantages which are important. The bandage has the advantage over plain gauze in that it is free from loose strands, while its width shortens the time required for packing. The diameter of the tube has been found sufficient for the passage of six inch bandage without causing jamming, provided that each bite with the obturator does not consist of more than about two inches of bandage. This system is preferable to other methods because it renders the operation clean by preventing the gauze from coming in contact with the vagina. It causes the patient very little pain, requires no trained assistants and can be employed without assistance in an emergency, and with the patient either across the bed, in the lengthwise position, or on a table. The uterine cavity and vagina can be thoroughly tamponed in this manner in a few minutes, and the employment of a single bandage renders unpacking easier.

The external surfaces must always be kept in aseptic condition in anticipation of packing, but no part of the gauze need be allowed to touch any part of the patient's body if the assistant, holding the tube containing the packing on the operator's right, keeps this at a suitable distance from the mouth of the packer—about six inches. Counterpressure on the fundus may be exerted by an assistant or the operator does this intermittently after passing two yards of gauze. As the uterine cavity fills up with gauze the packer recedes gradually when the cervical and vaginal canals are filled with the remaining part of the packing. As a rule seven to nine yards of this width of bandage suffices to pack the whole tract. The packing is extracted in from twelve to eighteen hours, the fundus uteri being massaged during the pulling out of the gauze and firmly compressed afterward, for the purpose of squeezing out any clots which may have remained behind the packing.

For successful packing by this method the precaution must be taken that the tube is guided into the uterine cavity proper before introducing the gauze, that each bite of gauze is not longer than two inches, and that fairly firm counterpressure is exerted on the fundus, so as to render the gauze tight inside the cavity. It is also advisable prior to packing to scoop out all clots from the uterus manually, lest they cause severe afterpains, which should be relieved by codeine without disturbing the pack.

When bleeding occurs while the placenta is still *in utero,* the obstetrician is confronted with a situation which demands much nicety of judgment. The first thing one does in such cases, assuming that an injection of pituitary extract has already been given, is attempt to arrest the bleeding by compressing the uterus. In many cases this will suffice for a time until the placenta becomes completely detached and can be expressed. Compression of the aorta, a method much advocated of late, may be of special value in arresting hemorrhage in cases of adherent placenta.

When the hemorrhage continues in spite of the three measures—pituitrin, compression of the aorta, and compression of the uterus—and if the placenta cannot be expressed by the Credé method, one must prepare to remove the placenta manually; and this must be performed before there is sufficient loss of blood to give rise to symptoms. The hazard involved in manual separation of the placenta is according to some authorities, not as great as was generally believed, but there is still a great difference of opinion on the subject. In 1915, Polak, in discussing adherent placenta, advised strongly against manual removal from below and recommended hysterotomy and removal of the placenta through the abdominal incision. This line of treatment was favored probably because in a special study of two thousand labors Polak encountered adherent placenta only once. In the same year, at the Rotunda, they met with twenty-eight cases in 2,070 deliveries. Hirst's incidence is one in 1,000 cases; Reynolds', three in 1,000; while Rice reported six cases to the 1,000 labors at the Manhattan Maternity. Rice also reported a hundred adherent placentas removed manually without a fatlity and with only three cases of fever above 101°. Rogoff studied the records of 52,000 labors at the Moscow Maternity which included 1,243 manual removals; and Baumm, who compiled statistics of seventeen German clinics comprising 20,418 labors with 248 manual removals both conclude that manual removal of the placenta *per se* does not carry much danger of infection, if properly performed. The latter ascribes most cases of mortality and morbidity following manual removal to the poor condition of the mother due to loss of blood and counsels against bleeding.

One also finds in the literature an undercurrent of belief that puerperal infection is not entirely a condition introduced from without and support is adduced in favor of this theory by the citation of cases of sepsis following spontaneous deliveries without any vaginal examinations.

In our series of hemorrhage cases the placenta was extracted manually in seventeen cases, resulting in one case of plegmasia alba dolens. While there is difference of opinion regarding the danger of manual removal, practically all agree that there is no choice in the matter when the condition is accompanied by hemorrhage. Reference has been made to the views on the subject outlined above only in support of a plea for less hesitation in removing the placenta in cases of bleeding. Aside from the more or less theoretical contention that there is less risk of infection if there has been less loss of blood, there are some substantial considerations why an adherent placenta should be removed early in cases of hemorrhage. One of these is that women seem to tolerate less loss of blood with the placenta retained than they do with the placenta out. Whether this is due to the psychic factor associated with the superstition with which the laity regard retention of the placenta is difficult to state. Another consideration is that thorough removal of an adherent placenta is a painful and somewhat delicate operation and requires putting the patient under anesthesia for proper performance. It is preferable, therefore, that the patient be in good physical condition when manual removal is undertaken. The most important point in connection with the technic of manual removal, outside of perfect asepsis, is that no particle of placenta be left behind. It is advisable, therefore, after the placenta has been extracted, to reintroduce the hand and palpate systematically the whole surface of the uterine cavity. It is also advisable, especially if the loss of blood has already been appreciable, to tampon the uterus thereafter, since in many cases removal of the placenta is not sufficient to arrest the hemorrhage.

A few of our patients have sustained losses of two quarts of blood without exhibiting symptoms, while others commenced to complain after hemorrhage of much smaller proportions. In moderate degrees of anemia the foot of the bed is raised about eighteen inches, the patient is given fluids in small quantity repeatedly, morphine, pituitrin, ergot and Murphy drip. The body is kept warm and the window open. In severe cases the patient may refuse to take fluids by mouth or may vomit. Resort must be had then to hypodermoclysis. This should always be given when the pulse is over 130 and fails to improve within a short time after arrest of bleeding. Usually a thousand c. c. of saline solution will produce considerable improvement in the patient's condition, but sometimes this has to be repeated in about eight hours. In ten of the cases hypodermoclysis was employed. Blood transfusion was prepared for in one alarming case, but was dispensed with as the patient rallied by the time the donor had been tested.

CONCLUSIONS.

Of all the maternal deaths associated with pregnancy, childbirth, and the puerperal state postpartum hemorrhage contributes the third largest number. The largest number of maternal deaths amenable to prevention are those caused by postpartum hemorrhage. Tamponade of the uterus, cervix, and vaginal canal offers the most dependable method for arresting postpartum hemorrhage. Adherent placenta, when accompanied by even moderate bleeding, is serious and impels manual invasion of the uterine cavity for its removal irrespective of the dangers involved in the operation.

1425 Madison Avenue.

Report of a Case of Pregnancy Following the Menopause

By MURRAY L. BRANDT, M. D.,
New York.

Although pregnancy occurring late in life is not a rare condition, in nearly all of the published records of such pregnancies, persistence of menstruation beyond the usual time of the climacteric was noted. Thus there are reported cases of pregnancy occurring in women of fifty-five and sixty-five years, who up to the date of conception were menstruating more or less regularly. To find conception taking place after the menopause has been definitely established, is a much rarer event.

Case.—Mrs. S. S., forty-six years of age, began to menstruate at thirteen, was always regular every twenty-eight days, married at eighteen years and since then had eleven pregnancies resulting in twelve children. The last labor occurred at thirty-nine years of age. Following this labor, the patient menstruated regularly for a year, the last period occurring in June, 1916.

In March, 1919, she applied for treatment for an increasing size of her abdomen, increasing weight and intraabdominal movements. Examination showed a much enlarged pendulous abdomen, fundus of uterus above umbilicus, fetal parts not definitely distinguished and no fetal heart could be heard. A diagnosis of pregnancy was suggested and on examination a month later distinct fetal parts and fetal movements were found.

In May, 1919, the patient was delivered of a male child weighing nine pounds. Incidentally this child showed all the signs of achondroplasia. Ten months after the birth of the child the patient, after weaning the baby, began to menstruate and had three normal periods. The menses have not returned since then.

COMMENT.

Although the patient presented a large uterus, the diagnosis of pregnancy at the first examination was rather difficult because of the vague history of intraabdominal movements since the cessation of menses three years before. A diagnosis of fibroid uterus had been made elsewhere and operation was urged.

The literature discloses only five other authentic cases of pregnancy occurring after menopause.

REFERENCES.

Priou: Last child at forty-eight; nursed baby and no menses followed. At seventy-two menstruated for six hours, then ceased for eight weeks and had a definite two months' abortion. *Bull. de la Soc. de Méd. d'Angers,* 1865.

Levasseur: Menopause at fifty; pregnancy two years later. *Gaz. Hebdomadaire,* 1873.

Underhill: Menopause at forty-nine; pregnancy two years later. *American Journal of Obstetrics,* 1879.

Depasse: Menopause at fifty-nine; pregnancy nine years later. *Gaz. de Gynecol,* 1891, Paris.

Hann: Pregnancy occurred three years after menopause. Following birth of child menses returned. *Journal of Obstetrics and Gynecology of British Empire,* 1903

161 West Eighty-sixth Street.

A Plea for Oophorotomy on All Pathological Ovaries and Resection of Diseased Tissue

By SOLOMON ROTTENBERG, M. D.,
and GEORGE SCHWARTZ, M. D.,
New York.

This plea for ovarian section in all pathological ovaries and resection of diseased tissue, is based upon the findings of two cases in which the patients were recently operated upon by us in the People's Hospital.

CASE HISTORIES.

Case I.—Miss C. E., aged nineteen, came to the hospital complaining of pain in the right lower quadrant, nausea and vomiting. She had never before been seriously ill. The family history was negative. Her last menstruation was two weeks before, accompanied by severe menorrhagia and dysmenorrhea. The pulse was 90; temperature 100.05°. F.; blood count: white blood cells, 12,000; polymorphonuclears 85 per cent. The urine examination was negative. There were no urinary symptoms and her other complaints had no bearing upon the diagnosis.

The physical examination of the patient showed heart and lungs normal. The abdomen: slight tenderness and rigidity over McBurney's point, otherwise negative. The patient was operated upon and an acute catarrhal appendix was found and removed; and following our usual routine, her pelvic organs were explored. The left ovary and both tubes looked normal, but the right ovary looked somewhat larger. This was split by cutting with a sharp scalpel through the convex outer border of the ovary from one pole to the other down to the pedicle. A small incapsulated tumor the size of a small grape was found and easily shelled out and removed from the central stroma.

Pathological examination showed it to be a typical dermoid cyst, containing some hair and toothlike bone. The patient made an uneventful recovery, and we have lost trace of her since her discharge from the hospital.

Case II.—Mrs. L. R., aged twenty-nine, married, four children. Complained of backache with generalized lower abdominal pain, which increased at each menstrual period. She also complained of menorrhagia.

The laboratory findings were normal. The general physical examination was negative. Vaginal examination showed a second degree retroversion of the uterus and bilaterally enlarged ovaries which were prolapsed and adherent to the pelvic peritoneum.

The operative procedure consisted of suspending the uterus and splitting the ovaries as in the last case. Here in the left ovary a small tumor was also shelled out of the medullary portion of the ovary, which also proved to be a small dermoid cyst. The right ovary showed multiple simple cysts which were excised and this ovary also sewed up as in the last case. The patient made an uneventful recovery, and as in the previous case we lost trace of the patient since her discharge from the hospital.

COMMENT.

These two cases are cited because heretofore it has been the custom with us, as well as with many other surgeons that we have seen operate, to make simple punctures with the needle or scalpel into whatever portion of the ovary seemed to be under tension, and feel assured that the patient was benefited and cured of her clinical symptoms by this procedure. This has for a long time appeared to us to be inadequate and incomplete, since most ovarian tumors have their origin in the stroma, and they do not appear on the surface before the growth is of sufficient size, and then only a macroscopic diagnosis can be made.

LITERATURE.

Marchandt (1) and Bonnet found a preponderance of embryomata in the medullary portion of the ovary. These embryonal rests may remain dormant for many years and suddenly grow to enormous cysts. Pfannenstiel (2) reported that he found accidentally small tumors in the medullary portion of the ovary in young girls during operations and postmortems. He believed that in time these would have grown to large dermoids and other types of cysts. His experience practically coincides with our two cases which would positively have been overlooked by the customary procedure of puncture, and could only have been found by oophorotomies. Pfannenstiel was one of the earliest writers to advise operation for dermoid cysts. We are urging a procedure that will make it possible for earlier diagnosis of ovarian growths in such ovaries that show evidence of pathology. Jones (3) in 1913 asserted that the treatment for all suspicious ovaries was oophorotomy, for frequently small tumors in the medullary portion of the ovary were overlooked unless the ovary was split in half. Mayo (4) states that seven per cent. of all dermoid cysts of the ovary are malignant, and the patients show very few menstrual disturbances. Bland (5) states that twenty-five per cent. of the cysts of the ovaries are malignant, although pronounced benign by the pathologist.

PLAN OF PROCEDURE.

After clamping the ovarian pedicle to control hemorrhage, we split the ovary in half by cutting the convex free border from pole to pole, down to the pedicle, much in the same manner as a kidney is split in nephrotomy. We now remove any diseased tissue that we may find, and in this manner we are sure not to overlook any hidden tumor. We then place a mattress suture through the ovary near the pedicle, which controls all bleeding from the small capillary branches of the ovarian artery after the clamp is removed. The cut margin of the ovary of the convex border is whipped together with fine continuous catgut lockstitch, and the procedure is finished without injury to the function of the ovaries.

CASES WHERE THIS IS APPLICABLE.

1. Where the ovary is large and seems cystic.
2. Where there are symptoms of menorrhagia, metrorrhagia and dysmenorrhea of ovarian origin.
3. In all suspicious looking ovaries.

Martin and Jung (6) state: "Primary ovarian carcinoma develops from the germinal epithelium by unlimited proliferation into the deeper tissues, and although the ovary is getting larger, the surface remains smooth and does not become nodular until the carcinoma permeates through the capsule, reaches the surface and then rapidly gives rise to a general peritoneal cancer." They assert that at an early stage these ovaries seem normal, except for being slightly enlarged, but on splitting the ovary the nodules can be easily felt and an early removal of the ovary is a lifesaving procedure. This one type of case would suffice to warrant the sectioning of all suspected ovaries and the two cases cited certainly justify our plan of procedure. In conclusion, we again wish to state that most ovarian cysts, especially dermoids, arise from embryonic rest in the medullary portion of the ovary. Simple cysts which grow to large proportions, also originate in the medullary portion. The small cysts on the surface of the ovary rarely grow large enough to cause any disturbance, therefore, the cysts that cause the most trouble are those originating in the medullary portion of the ovary, which would be entirely overlooked unless the ovary is split in half.

CONCLUSIONS.

1. Splitting of the ovary for examination where the appearance is pathological is a harmless procedure.
2. In all suspected cases opening the ovary is entirely justifiable, as by so doing we can discover hidden tumors which we would otherwise miss.
3. We have twice found dermoids in the substance of the ovary, which would have been missed, had we simply punctured the ovary.
4. The plan of procedure is simple and thorough.
5. It is applicable only in enlarged ovaries and those suspected of being in a pathological condition by the clinical symptoms.

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People's Hospital.

A New Virgin Vaginal Speculum

Presenting Improvements Over Older Models

By GEORGE EDWARD BARNES, M.D.,
Herkimer, N. Y.

The virgin vaginal specula now on the market have their fulcrum so far in front of the hymen that when their blades are spread apart the hymen is stretched, causing pain and even laceration. The chief distinctive feature about my speculum is the location of the fulcrum on the plane of the hymen. The spreading of the blades does not injure the hymen or cause pain—most important matters. Other practical features are the greater narrowness and thinness of the blades, permitting their introduction through a smaller cleft, and the greater length of the blades, permitting the cervix to be readily reached even in adult virgins and in married women with tender parts. The longer blades increase the general utility of the instrument but it would sometimes be advantageous to have also another speculum with shorter blades.

I have made drawings instead of photographs of my speculum because the instrument makers did not make the model of the speculum which I now have exactly according to my specifications and because I wish to make some improvements over the first design.

DESCRIPTION OF INSTRUMENT.

The large drawing represents the speculum viewed obliquely from the front and from the right of the observer, and the small drawing represents the speculum proper, chiefly its funnel or expended end, from in front. The elevating pin passing through the lower wall of the funnel is important. This is the fulcrum on which the two halves of the instrument act and in the drawing it is shown pushed up so as to separate the blades vertically. The handles of the instrument are an upper male of flat material about one and five tenths mm. thick and a lower female about five mm. wide and about seven mm. high having a slot where the upper male handle has to pass through it. On the side of the upper handle, quite near to the free end, are many conical holes into which fit the conical end of the screw which presses through a well adapted hole in the inner half of the lower handle. This latter hole should be somewhat deepened by having a collar about it projecting from the surface of the handle so that the screw will not be likely to fall out. The length and shape of the handles is indicated sufficiently by the large drawing. The thickness of the upper handle should fit well but not tightly in the slot in the lower handle so that there will be free play up and down, but no side motion. The curve on each end of the upper handle should be carefully made so as to allow but little movement of the upper handle forward and backward in the slot of the lower handle. It is obvious that the adaptation of the handles to each other allows the blades to be moved on the fulcrum, i. e., the elevating pin, and holds the blades from deviating from each other laterally. Therefore the two handles should be attached to the funnel in the same vertical plane. On the lower handle is an arm projecting vertically downward having on its inner surface closely placed slanting ridges on which may be rested the handle of the elevating pin, which handle has its outer edge supplied with a projection to fit into the notches in the vertical arm. The direction of the inner surface of the vertical arm must allow the handle of pin to fit against it flatly. The vertical arm and the pin handle must not collide with the lower projection of the upper handle when the latter is depressed.

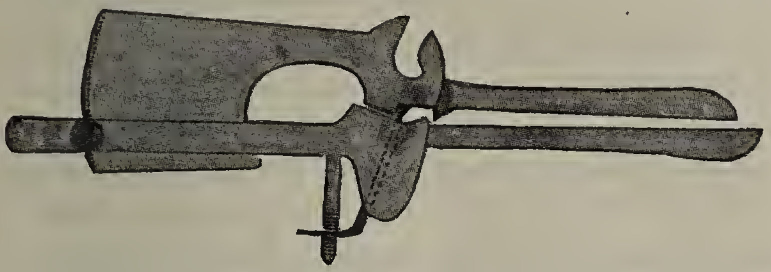

Fig. 1.—The G. E. Barnes virgin vaginal speculum.

The funnel portion is much more shallow than the corresponding part in other specula. It is almost flat except where it passes into the blades. That portion of the lower part of the funnel where the pin passes through must be somewhat thickened in order to make the tunnel for the pin. Preferably, this tunnel should not be perfectly round but should be of some form, e. g. oval, to prevent the pin handle from swinging away around into the region of the anus. Of course, the pin should be of a corresponding form and should be of small diameter. The upper end of pin should be slightly enlarged to prevent it from falling out of tunnel. The upper end of the tunnel through which the pin passes should be at the junction of the lower funnel and the lower blade. And the end of the pin should come into contact with a similar point between the upper funnel and upper blade. Against this latter point the end of the pin acts when the pin is elevated or lowered to regulate the vertical distance between the two blades.

On each side of each half of the funnel is a flange, shown best in the smaller drawing. The flanges on each side of the lower funnel are only one mm. high. The flanges on each side of the upper funnel are higher, about four mm. The upper flanges slip behind the lower ones when the blades are brought together. The flanges prevent the folds of the labia from being pinched when the blades are brought together and, furthermore, one flange on the upper funnel, as its end rests against the pin, prevents the upper half of the instrument from slipping on the lower half. The handles are attached to the funnel at the areas represented dark in the side of the small drawing. The opposite side of the funnel is made wider in order to keep the labia away from the funnel on that side. The open space represented in the smaller drawing between the two halves of the instrument is a little wider from side to side than it should be.

The total length of the upper funnel and blade is eighty-three mm. and the total length of the lower funnel and blade is eighty-seven mm. The narrowest part of the blades, near the funnel, is seventeen mm. wide and the widest part is nineteen mm. wide, measurement being made by air line across the concavity from outer edges. The combined height of the blades when closed is nine mm. in front and twelve mm. toward the free end, measurement being made from outside surface (with a pair of compasses). However, I think it would be better to have the blades of uniform width, seventeen or eighteen mm., and of uniform height, nine or ten mm., throughout.

In the latter part of 1920 I began to correspond with manufacturers of surgical instruments trying to interest them in my new virgin speculum so that they would manufacture it for general sale. After a time I discovered that nearly all vaginal specula made in this country are made by two firms. One after another, all these firms declined to manufacture the new instrument either because they do not manufacture any vaginal specula or because the cost of the tools required for making my speculum would be so great as to make the undertaking a bad business proposition. Apparently, only comparatively few virgin specula are sold. Some of the firms stated that they would manufacture my speculum if I would furnish the money to pay for the required tools, the necessary sum being estimated at seven hundred and fifty to a thousand dollars. Since the manufacturers prefer to continue to sell the old patterns of specula to save the expense of the tools for making my new instrument, it is evident that the latter will not be manufactured unless the profession makes a demand for it. At present, those wishing to obtain my speculum must place a special order with an instrument maker.

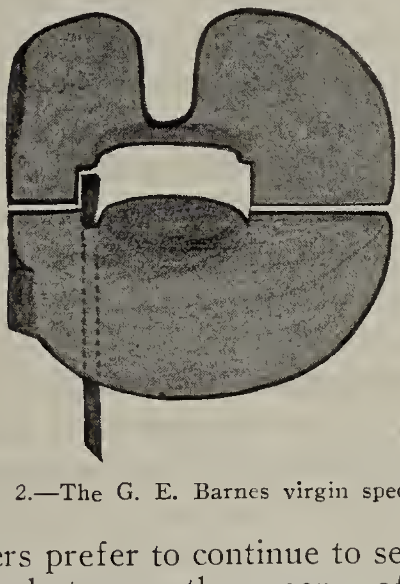

Fig. 2.—The G. E. Barnes virgin speculum.

It is possible that large specula made according to the principle of this virgin speculum would possess greater utility than the larger specula which are now in use.

I have not applied and I trust that no one else will apply for a patent on my speculum.

125 Mary Street.

Editorial Articles

RADIOTHERAPY IN DISEASES OF THE BLOOD.

The action of x rays on human blood consists of an immediate leucocytosis with abundant polynucleosis and slight mononucleosis with a moderate increase of the red cells; secondly, a consecutive decrease of the white cells, the percentage of polynuclears and mononuclears remaining unchanged, and thirdly, an abundant and continuous increase of the red cells.

The principal affections in man to which the x rays are directed are the chronic leucemias. In the acute types of this process the x rays have remained without effect. Lymphatic leucemia presents three forms, namely, the purely lymphatic type; the combined lymph node and splenic hypertrophic type, and the purely splenic type. The irradiations should be directed on all the lymph node groups as well as on the spleen. The treatment is both long and minute on account of the multiplicity of the points of application of the rays. Hypertrophy of the spleen, when it exists, is the first to subside, while the adenopathies occasionally disappear with great rapidity—after two or three seances with three H units through an aluminum filter of three millimetres.

At other times sedation of the process is slower to take place, but the general health is invariably improved in all cases. From the hemotological viewpoint a return to an almost normal count is the rule, while at the same time the appetite and strength return. This condition of affairs may last for three to five years, but at length a recurrence of the process inevitably ensues which ends in death, although the process may take several years to run its course, thus giving the illusion of a permanent cure. The maximum lease of life so far observed in chronic myeloid leucemia has been eight and a half years, the average being much less, namely, two years and a half. Myeloid leucemia rarely offers but one type, namely the splenomegalic, and enlargement of the lymph nodes is rarely met with. The general health is always more or less involved.

Generally speaking, the good results reported recently have been obtained by filtration through two to three millimetres of aluminum and there is a tendency at present to filter through six millimetres. It is quite impossible to treat the entire spleen by irradiations at once. Very frequently, in fact, the surface to act upon may be as much as thirty centimetres long and the breadth even more. Hence it is necessary to divide the splenic region into segments, each of which receives about the same dose of radiation. This socalled checkerboard method gives the best results, each area receiving the dose of three H units every fortnight. At the first séance the total surface to be irradiated is divided into squares of about ten centimetres each and under treatment the splenic mass will actually melt away.

All cases of lymphatic leucemia and chronic myeloid leucemia are amenable to radiotherapy. There are no cases which fail to respond, but the splendid results obtained are unfortunately only temporary. For a number of years the patient may present every appearance of health and by treatment the blood count tends to become normal, the hyperleucocytosis drops, and it is not uncommon to observe a leucopnea. At the same time the number of red cells and the hemoglobin become nearly normal, while the myelocyte tends to disappear, but this is merely apparent because it will invariably be found.

For the present, radiotherapy is the treatment of choice for the chronic leucemias; it is superior to both radium and benzol, but it is only palliative and no permanent cure has yet been recorded. Beside the chronic leucemias, radiotherapy has given some good results in Vaquez's disease Banti's disease, and in aleucemic lymphadenias occurring in certain hemolytic states.

ACCURACY

In a paper entitled Ocular Symptoms of Epidemic Encephalitis,' published in the January number of the *American Journal of Ophthalmology,* Dr. Matthias L. Foster pleads for greater accuracy in the observing and recording of the eye symptoms in encephalitis. He says that these symptoms are sometimes the first to appear and are prone to be the most annoying to the patient, yet he has found indefinite statements concerning them to abound even in otherwise well worked out case reports. He says that mention is frequently made of ptosis, diplopia, strabismus, and mydriasis, with occasionally a note concerning the pupillary reactions, and that, as a rule, the records are vague, while they might easily have been made definite and accurate.

The point made is a strong one. Take the symptom of diplopia for example. This is a subjective symptom, the patient sees double, almost invariably caused by a paralytic condition of one or more of the recti, but by no means always of the same ones. It is easy for the examiner to have the patient look up, down, to the right, to the left, and to note whether either eye is arrested in its excursion in any direction, whether it stops abruptly at the middle line, or crosses this line and then lags behind. Then an accurate statement is possible; diplopia due to paralysis or paresis of the muscle which fails to act normally in moving the eye. Perhaps, as shown in one of Dr. Foster's cases, one muscle may be affected in one eye and a different one in the other.

Take the term strabismus. Ophthalmologists have tried to restrict the use of this term to conditions in which the deviation of an eye from its correct position is not due to a paralytic condition of any of the muscles, but not as yet with much success. It is commonly used to denote a deviation of an eye in, out, up or down from its normal position without reference to the cause, but as a symptom in such a disease as this its value is wholly dependent on whether its cause is paralytic or not. The same test as in diplopia determines this point and also reveals which muscle, if any, is affected. Again, accuracy has been easily attained.

Mydriasis means dilatation of one or both pupils. Some persons have much larger pupils than others, so it may happen that a size which is normal in one person may represent a fair degree of dilatation in another. Or the pupils may be dilated because the patient is frightened, a condition which may also impair the light reflex and so needs to be always borne in mind. Inequality of the pupils is more serious; in the majority of cases it points to some lesion in the cerebrospinal system. But, no matter what the condition of the pupils, nothing can be learned from it unless the reflexes to light and convergence are taken into account, and it is easy to determine these. Flash a bright light into the dilated pupils and see if they contract. Have the patient look far away into the distance, then suddenly have him focus his eyes on a finger held a few inches away, and see if the pupils contract. In this way definite observations have been made which are worth recording in conjunction with the mydriasis.

Does the ptosis affect one eye or both? Does the drooping lid merely have its margin at a slightly lower level than the other, or is the patient unable to open the eye at all? Of course this is only a matter of degree, for ptosis noted as a symptom in such a disease as this means a paralytic condition more or less pronounced of the levator palpebræ, but accuracy in the observation and record of the degree of ptosis gives an accurate idea of the degree of existing paresis.

There is scarcely a calling in which accuracy is not insisted upon to a much higher degree than it is in medical records. Go into a newspaper office and note the emphasis placed upon it. Other virtues are commendable there, but accuracy is the one placed above all others. Accuracy in observation, accuracy in statement. Check up the work of a reporter on a daily paper and you will find him accurate to a remarkable degree. Not that he is always right; he is human like the rest of us, and when dealing with a subject of which he knows nothing, like medicine, he often makes some amusing mistakes, but the great mass of his work is free from inaccuracy, or he soon seeks employment in another field. Accuracy is an essential for the purveying of material for an evanescent publication which is read today and used tomorrow to kindle the fire. Would that the reporters for the medical press could have such a training in accuracy. They are not working for an ephemeral publication, but for one intended to be read and studied, to be an aid in the relief of human misery. Far more than in the daily press is accuracy of observation and statement essential.

INTRACRANIAL HYPERTENSION AND ITS TREATMENT.

The syndrome of intracranial hypertension comprises four principal symptoms, namely, headache, vomiting, edema of the papilla, with disturbances of sight which ensue, and marked changes in the cerebrospinal fluid. The headache, which is not influenced by medical treatment, is often entirely relieved by decompression. Vomiting is probably the consequence of a reaction of the hypertension on the vestibulum, while the edema of the papilla is a fundamental element in the diagnosis of hypertension. After a time this edema is replaced by papillary stasis which in turn results in atrophy of the structures of the papilla with cecity.

The two great factors of intracranial hypertension are hydrocephalus and neoplasms. The tumors which are easiest to localize are those in the Rolandic area, the occipital region, the hypophysis, and at the pontocerebellar angle. Growths in the Rolandic area give rise to motor disturbances, Jacksonian epilepsy, paresis, monoplegia and hemiplegia. Those of the occipital region give rise to visual disturbances — homonymous hemianopsia — while growths of the hypophysis are readily diagnosed by acromegalia, gigantism, the genital adiposis and bitemporal hemianopsia. Finally, tumors of the pontocerebellar angle gives rise to cerebellar disturbances.

The operative indications are above all indicated by the headache and edema of the papilla, and as soon as the latter has been diagnosed operation should be resorted to, because diminution of the visual acuity sometimes ensues very suddenly. Lumbar puncture, which is dangerous in cases of intracranial hypertension, ceases to be so after the patient has been trephined, and when the cause of the hypertension is unknown it is well to follow Cushing's rule and trephine over the subtemporal region. Both subtemporal fossæ should be opened after an interval of a few days.

At the first operation the skull only is opened over the left subtemporal fossa and in not a few cases this will be enough to relieve all the symptoms, but if after a fortnight the edema of the papilla has not entirely disappeared the dura may be incised. However, it is usually better to trephine over the right subtemporal fossa and incise the dura on this side, because the disturbances resulting from cerebral hernia are much less marked than after incision of the dura on the left side. Before incising the dura lumbar puncture should invariably be done. When the dura has been incised on the right side, if a tumor is not found, the dura on the left may be incised sometime later if the cutaneous cicatrix is perfectly clean, and by proceeding in this way tumors that could not be localized are discovered.

In cases of hydrocephalus the results of decompression are not as much good as in hypertension from tumors. In hydrocephalus it has been proposed to drain the ventricles in the subarachnoid space or into the subcutaneous cellular tissue, but puncture of the ventricle through the opening in the skull, done from time to time as symptoms warrant, will be sufficient.

When the syndrome of hypertension is due to a neoplasm which can be localized an attempt should be made to remove the tumor. Certain growths arising on the inner aspect of the skull can be detected by the x rays. The operation should always be done with local anesthesia with the patient seated, thus avoiding shock.

The results obtained are occasionally surprising and the majority of patients will derive great benefit although they are not cured. They finally die from the evolution of the process but without suffering and retaining their sight.

BOTULISM.

This is a rather neglected subject, a fact to be deplored, because in point of fact the disease is a serious one, the mortality varying between thirty per cent. and sixty per cent. It is a disease contracted by the ingestion of sausages, preserved meats, etc., although it is a curious fact that these products made at home are more prone to give rise to it than manufactured articles. However, a certain number of epidemics have been due to commercial products. On the other hand, it must be admitted that the generally accepted opinion that botulism can only be derived from preserved meats should be discarded, because vegetables—olives, beets, beans, asparagus, etc.—are not less inoffensive than others when they contain Bacillus botulinus.

This bacillus is an anaerobic organism, noninfectious, and can rarely be found in the organism after death. It acts by its toxin which is endowed with a great affinity for the nervous system. The bacillus is destroyed at a temperature of 70° C., but the spores possess a far greater resistance. On the other hand, an acid medium—lemon juice or vinegar or one containing a high degree of salt (ten per cent.)—prevents the development of the bacillus.

The affinity of the botulic toxin for the nervous system is made evident by the symptomatology of the affection which is almost exclusively neuropathological. It is, in fact, to be noted that botulism essentially differs from other affections due to food poisoning by the absence of pyrexia and general symptoms, as well as by the frequent absence of gastroenteritis, at least one of any severity. Gastric pain is never very marked and vomiting is infrequent. On the other hand, constipation is the rule, and since it is due to inhibition of the motor functions of the digestive tract, it resists every kind of medication and is occasionally accompanied by distention of the intestines from gas. These few digestive symptoms develop after a phase of latency averaging from one to three days.

The first neuroparalytic symptoms to arise are ocular disturbances; there is paralysis of accommodation, mydriasis and often paralysis of the third pair. Next the mouth becomes dry, there is paresis of the tongue, dysarthria, quite frequently paralysis of the muscles of the velum and pharynx, hence very distressing dysphagia, and the paralysis frequently extends to the laryngeal muscles resulting in more or less complete aphonia.

At the same time there is a decrease of contractility of the voluntary muscles—muscular weakness with true paralysis—motor incoordination with diminished tendon reflexes, absolute anorexia, complete suppression of the sudoral, lacrymal and milk secretions and frequently retention of urine. If death is to ensue other bulbar symptoms develop reacting on the respiration which becomes accelerated, superficial and dyspneic. Death takes place in from four to eight days, according to the intensity of the poison.

The prophylaxis of botulism consists of perfect sterilization of all preserved meats and vegetables at a temperature of not less than 100° C. The brine used for pickling should contain at least ten per cent. sodium chloride. If vinegar is used the acetic acid content should be over two per cent. Foods which lend themselves to anaerobic fermentation, such as sausages, salted meats and fish or canned meats, should never be eaten raw.

As to treatment, saline aperients, rectal or subcutaneous injections of physiological salt solution are indicated for producing diuresis and to control thirst, strychnine in large doses to sustain the nervous system, and pilocarpine to induce the return of the sudoral function. An antibotulic serum is at present being studied and has already given good results in experimental work on animals.

OPINIONS ON PUBLIC HEALTH QUESTIONS.

A questionnaire on certain unanswered questions arising from the conference, held in Washington, D. C., March 14th and 15th, on the future of public health in the United States and the education of sanitarians, was sent out to those who attended. The opinions of the ninety-eight individuals from whom responses were received furnish some valuable data on certain public health problems, some of which it will be of interest to summarize.

There was a strong preponderance of opinion in favor of the Public Health Service sending a representative to the various medical schools and universities, which offer courses for the training of sanitarians, for the purpose of conferring with presidents and deans, and of giving to students, through the medium of addresses, information regarding the field of public health as a life career. In response to the question, What other specific steps may be taken by national health agencies to bring before university students information regarding the field of public health? thirty-five suggested the preparation and publication of an attractive pamphlet, to be sent not only to medical, but to premedical students in the universities, and possibly to some high schools. "After the medical school has been entered," said Dr. H. von W. Schulte, "it is too late to expect many recruits." Several felt that the first step was the education of the faculty, who in turn might direct the interests of their students. The great value of motion pictures, charts, drafts, plates, and portable museum material to stimulate interest was mentioned.

What specific steps may be taken by some national health agency to get public health work "out of politics"—to make the tenure of sanitarians more secure and their salaries more nearly adequate? was another question. "God only knows!" replied one, and another, "Why waste time trying to change the unchangeable?" More optimistic members of the profession agreed generally that education of the public was the step of prime importance. Suggestions as to how to do this were varied. Dr. W. H. Welch said "through city clubs, chambers of commerce, and manufacturing associations." "Well prepared papers in a magazine that reaches the public, advised Dr. W. H. Howell. Dr. W. F. Snow suggested the publication of impartial case studies of the wrong use of politics in relation to public health. Other suggestions were public conferences, the use of local chapters of voluntary organizations, the extension of civil service to public health offices, and the assistance of the United States Public Health Service in establishing requirements, holding examinations, and selecting candidates. As to the tenure of office by sanitarians, there were several suggestions, among them the formation of a voluntary committee for the investigation of all cases in which politics interfered with the position of a health officer, the findings of this committee to be published.

The agencies best fitted to take the steps recommended, named in the order of the frequency with which they were mentioned, are the United States Public Health Service, the American Public Health Association, the American Medical Association, the National Health Council, the American Red Cross, women's organizations, nonofficial organizations, local medical associations, the Rockefeller Foundation, a special committee, the National Child Health Council, Life Extension Institute, Bureau of Education. The first four were included many more times than the others.

Opinion was much in favor of another conference, to be held within a year, on the training of sanitarians under the auspices of the Public Health Service. The question was asked: At this future conference, proportionately what time should be given to the education of sanitarians now employed and to the education of future sanitarians? Thirty-two replied that they would give equal time to each problem, twenty-six that they would give more time to the future sanitarians, and fourteen to the sanitarians now employed. Various suggestions were made as to improving the program in this future conference, most agreeing, however, that the first conference was a great success.

Opinions varied as to the best way to provide for the education of sanitarians. Among those given, in the order of their frequency, were: The short, intensive postgraduate course, lasting about six weeks, in connection with a school of public health; the use of summer schools for this purpose; the special institute: "Periodical institutes," said Dr. Walter H. Brown, "should be conducted through state departments of health, and promoted by the United States Public Health Service"; correspondence courses, bulletins and periodicals, reading courses, and supplementary instruction and training.

In response to the question, What conclusions did you personally reach, as a result of the recent conference, regarding the education of future sanitarians and of those now employed? the statement of Dr. Allen W. Freeman, "that existing methods have been reasonably effective and should be extended," represented a consensus of opinion. It seemed to be generally felt that the education of sanitarians now employed had been sadly neglected, and should receive careful attention.

What distinct specialties in the field of public health should now be recognized? brought most interesting replies, indicative of an incipient and growing realization of the wide extent of the public health field. The specialties listed, with the number of those mentioning each, follows: Sanitary engineering, twenty-three; administration, eighteen; epidemiology, seventeen; child hygiene, sixteen; laboratory work, fourteen; vital statistics, fourteen; industrial hygiene, twelve; public health education, nine; preventive medicine, six; mental hygiene, six; research, five; social hygiene, four; nutrition, four; school hygiene, three; rural hygiene, three; physical education, two; serology, two; tuberculosis, two; economic and social aspects, one; business management, one.

The sending out of the questionnaire and the tabulation of replies received has certainly added to the valuable work done by the conference itself, especially in the way of defining and establishing high standards, and of raising and clarifying those already in practice. The conference and its results will be contributions of the greatest significance to the able administration of public health in the United States.

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News Items.

Occupational Diseases Excluded from Operation of Oregon Workmen's Compensation Act.—The Supreme Court of Oregon has decided that according to the meaning of the workmen's compensation act of that State, an occupational disease is not a "personal injury by accident," and therefore is not compensable. The questioned disease in this case was lead poisoning.

American Surgical Association.—The annual meeting of the association was held in Washington, D. C. The following officers were elected for the ensuing year: Dr. Lewis L. McArthur, of Chicago, president; Dr. Ellsworth Eliot, Jr., of New York, and Dr. Donald C. Balfour, of Rochester, Minn., vice-presidents; Dr. Robert B. Greenough, of Boston, secretary, and Dr. Charles H. Peck, of New York, treasurer. The next meeting is planned for June, 1923, in Rochester, Minn.

Philadelphia Laryngological Society. — Dr. George W. MacKenzie was elected president at the annual meeting of the society on June 6th. Other officers were elected as follows: Dr. William A. Hitchler, vice-president; Dr. Henry A. Leslie, re-elected secretary, and Dr. Arthur J. Wagers, treasurer.

American Otological Society.—Dr. George E. Shambaugh, of Chicago, was elected president at the annual meeting of the society held in Washington, D. C., May 2d and 3d. Other officers were elected as follows: Dr. John B. Rae, of New York, vice-president, and Dr. Thomas J. Harris, of New York, secretary-treasurer.

American Society for Clinical Investigation.—At the annual meeting of this society held in Washington, D. C., on May 1st, Dr. Elliot P. Joslin, of Boston, was elected president; Dr. Charles F. Hoover, of Cleveland, vice-president; Dr. James H. Means, of Boston, secretary, and Dr. Ralph Pemberton, of Philadelphia, treasurer.

Columbia University Prize Honors.—Dr. Edgar Fahs Smith, formerly provost of the University of Pennsylvania, was awarded the Chandler gold medal at the annual commencement of Columbia University. In the School of Medicine the Harold Lee Mierhof memorial prize was divided between Harold Alexander Abramson, of New York, and Samuel Harold Gray, of Brooklyn.

American Orthopedic Association.—Dr. Ralph R. Fitch, of Rochester, N. Y., was elected president of the association at its annual meeting held in Washington, D. C., May 2d to 4th. Dr. W. S. Baer, of Baltimore, was elected president-elect; Dr. Fred H. Albee, of New York, vice-president; Dr. John L. Porter, of Chicago, secretary, and Dr. DeForest P. Willard, of Philadelphia, treasurer.

Personal.—Dr. John L. Heffron, for fifteen years dean of the College of Medicine of Syracuse University, recently resigned his connection with the college after forty years' service. He will be succeeded by Dr. Herman G. Weiskotten, professor of pathology in the university.

Dr. Ross G. Harrison, a member of the medical faculty of Yale University, has been elected an honorary member of the Royal Academy of Medicine of Turin.

Dr. Nathaniel W. Faxon, of Boston, has been appointed director of the Strong Memorial Hospital, which is the new School of Medicine and Dentistry of the University of Rochester, New York.

Dr. Henry F. Patton and Dr. Robert C. Austin are directors of a new goitre clinic recently established in Dayton, Ohio.

Dr. Blanche A. Burgner, of Chicago, was elected president of the Chicago Medical Women's Club on June 14th.

Dr. Walter B. James, of New York, received the honorary degree of doctor of laws at the annual commencement of Harvard University.

Dr. Lewis C. Taylor, Springfield, who has been executive secretary of the state board of medical examiners during the past twenty-five years, sent in his resignation on June 7th to W. H. H. Miller, head of the department of education and registration.

Southern Surgical Association.—The annual meeting of this society will be held in Memphis, Tenn., December 12 to 14, 1922, under the presidency of Dr. C. Jeff Miller, of New Orleans.

Brooklyn Maternity Hospital Celebrates Anniversary.—An informal reception was held at the Brooklyn Maternity Hospital on Wednesday, June 14th, to celebrate the first anniversary of the opening of the institution.

Junior Microanalyst.—The United States Civil Service Commission announces an examination for junior microanalyst on August 9, 1922, to fill vacancies in the Bureau of Chemistry, Department of Agriculture, for duty in Washington, D. C., and in the field, at $1,400 to $1,800 a year. For further particulars write to the Commission in Washington.

First Aid on the Sea.—According to an amendment of the Navigation (Health) Regulations of Australia, passed February 1, 1922, every foreign going ship or Australian trade ship traveling 600 miles or more between consecutive ports of call with more than ten persons on board must have, in the absence of a ship's doctor, a person certified by an approved authority as qualified to render first aid. St. John's Ambulance Association, St. Andrew's Ambulance Association, St. Patrick's Ambulance Association and the British Red Cross Society are among the authorities recognized.

Michigan State Medical Society.—Dr. William T. Dodge, of Big Rapids, was elected president at the fifty-seventh annual meeting of the Michigan State Medical Society, in Flint, June 7th to 9th. Other officers were elected as follows: Dr. Joshua G. R. Manwaring, of Flint, Dr. William E. McNamara, of Lansing, Dr. Theodore F. Heavenrich, of Port Huron, and Dr. William K. West, of Houghton, vice-presidents; Dr. Frederick C. Warnshuis, reelected secretary. The action taken by the American Medical Association at St. Louis was adopted and approved by the delegation, and the body subscribed its support in instituting these constructive measures in the State of Michigan.

Aeroplane Ambulances.—The Air Service of the United States Army has been using aeroplane ambulances since the early part of 1918, shortly after the first one was constructed in February of that year. A little later all flying fields had to convert a suitable plane into an ambulance for use in emergencies, according to instructions from the Chief of Air Service in Washington. The French Army also is making increasing use of the aeroplane ambulance. An extract from the Paris Figaro of December 5, 1921, says: "A few weeks ago in Morocco the ambulance aeroplane made a remarkable record by transporting eighteen wounded men eighty kilometres; now we hear that in the Levant they have just evacuated forty-four wounded a distance of four hundred kilometres over the desert of Syria between Deir-ez-Zor, on the Euphrates, at the southern border of our mandate, and Aleppo." It is thought that the promptness of first aid, and the comfortable trips at great speed which the aeroplane makes possible, will lessen much suffering and at times save lives. This method of transporting the sick and wounded will in a short time become of tremendous importance, many authorities believe.

American Association for the Study of the Feebleminded.—The annual meeting of the association was held in St. Louis, May 10th to 20th. Officers for the ensuing year were elected as follows: Dr. Charles Banks McNairy, superintendent of the Caswell Training School, Kinston, N. C., president, and Dr. Benjamin W. Baker, superintendent of the New Hampshire School for the Feebleminded, Laconia, N. H., secretary-treasurer.

Civil Service Examinations.—Among the positions for which the New York State Civil Service Commission will hold examination on July 15th are the following: Laboratory assistant in bacteriology, division of laboratories and research, State Department of Health, $900 to $1,500; laboratory assistant in serology, division of laboratories and research, State Department of Health, $1,200 to $1,800; assistant physician and assistant surgeon, state and county institutions, with immediate appointments expected at the Rome State School at $2,200 and $1,600; assistant in biological chemistry, Psychiatric Institute, Ward's Island, $1,700 with an allowance for maintenance; medical assistant to director (Tuberculosis Department), Grasslands Hospital, Westchester County, $3,000 with maintenance.

Rockefeller Foundation Fellowships.—In a review of the activities of the Rockefeller Foundation, President George E. Vincent states that one hundred and fifty-secen individuals during 1921 held fellowships, funds for which were directly or indirectly supplied by the Rockefeller Foundation. These fellowships fell into five groups: 1, fifty-four fellowships in public health under the International Health Board; 2, fifty-two fellowships administered by the China Medical Board; 3, sixteen fellowships in medical education; 4, thirty-four research fellowships in physics and chemistry supervised by a special committee of the National Research Council, and 5, one member of the International Health Board staff, who on what is known as study leave, was engaged in special study. The distribution of these fellows by countries was: seventy-one Americans, one Belgian, seven Brazilians, eleven Canadians, one Singhalese, seventeen Chinese, one Colombian, two Costa Ricans, nineteen Czechs, seven British, four French, one Guatemalan, one Mexican, two Nicaraguans, seven Poles, two Salvadoreans, two Syrians and one Norwegian.

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Died.

Alexander.—In New York, on Thursday, May 18th, Dr. Welcome Taylor Alexander, aged seventy-four years.

Andrews.—In Chicago, on Tuesday, May 30th, Dr. John James Andrews, aged forty-two years.

Aronson.—In New York, on Saturday, June 24th, Dr. Edward A. Aronson, aged forty-seven years.

Beaudry.—In New York, on Monday, May 22nd, Dr. Elmer Brownell Beaudry, aged sixty-one years.

Boggs.—In Pittsburgh, Pa., on Friday, June 2nd, Dr. Russell H. Boggs, aged forty-seven years.

Hall.—In Kansas City, Mo., on Saturday, June 10th, Dr. Crawford Lester Hall, aged seventy-six years.

Laveran.—In Paris, France, on Thursday, May 18th, Dr. A. Laveran, aged seventy-seven years.

Miller.—In Brooklyn, on Saturday, June 3rd, Dr. John F. Miller, aged seventy-five years.

Smith.—In Cleveland, on Friday, May 19th, Dr. Daniel Buttrick Smith, aged seventy-one years.

Taylor.—In Westhampton, Va., on Tuesday, May 30th, Dr. Hugh McGuire Taylor, aged sixty-six years.

LONDON LETTER.

(*From our own correspondent.*)

British Medical Missions—Congress of Radiology.

LONDON, *June 13, 1922.*

At an exhibition held recently in London by the Church Missionary Society, the work of medical missionaries in Africa and the East was scenically displayed. The medical work of the Church Missionary Society dates in reality from 1813, but the first permanent medical mission was not started until 1865, when a dispensary was opened in Kashmir. Today the society has hospitals in East and West Africa, Egypt, the Sudan, Palestine, Persia, India and China. The medical mission exhibit consisted of a representation of a typical mission hospital, arranged to give as complete an idea as possible of the varied work and full equipment of a thoroughly up to date hospital. Surrounding the hospital on two sides were courts, in which were displayed exhibits and photographs illustrating the work of the missions. A wide corridor ran through the hospital building, and from this the various departments were entered. There was a ward containing ten beds, next to it the operating theatre, and there were an x ray room, a laboratory and a dispensary. It should be borne in mind that medical missionaries have exceptional opportunities for research work in tropical and obscure diseases, and it should also be remembered that handicapped as they have been by lack of time and facilities, some valuable discoveries relating to tropical diseases and their alleviation and cure have been made by medical missionaries.

Perhaps the most interesting and illustrative part of the exhibition was the models shown of Church Missionary Society hospitals at Mengo, Uganda; Cairo, Egypt; Peshawur, India, and Pakhoi, China. Old Cairo, in which the medical mission is situated, is the Nile port of the Egyptian capital. The Old Cairo Medical Mission was started in March, 1889, in a large native house which for eight years was the home of the Old Cairo Medical Mission. By 1890 the hospital had increased to the extent of five beds, and by 1894 the native house in Old Cairo was devoted wholly to in patient work, while the Selamik, guest house, of the old ruined palace of Suleiman Pasha el Fransawee of Egyptian historical fame was rented for use as a dispensary. In 1895, the compound of about two acres now occupied was purchased, and in 1896 funds had been collected to build residences and a small hospital, which was publicly opened in 1897. This building contained accommodations for twenty-five patients, and was divided into two equal sections, one for women and children and the other for men. Up to 1900 the outpatient department was still being carried on in the old Selamik, and though otherwise suitable its distance from the hospital was a great disadvantage. Consequently in that year, in response to an appeal, a fine out patient block was built and at the same time special wards were built, for the accommodation of cases of ankylostomiasis. The treatment of ankylostomiasis has always been an outstanding feature of the Old Cairo Medical Mission work and has been particularly successful. It was soon found that the special wards referred to above were quite inadequate and in 1907 a spacious ward for men, capable of accommodating a hundred patients, was completed. The women patients were still accommodated in their original ward until 1910, when a separate ankylostomiasis section was constructed for women. Large wards and shelters have also been added in recent years for the accommodation of all ankylostamiasis patients.

The ankylostomiasis section, however, was not the only part of the Old Cairo medical work to expand and develop, for during the two decades 1900 to 1920, the general work of the hospital, and especially of the surgical side, was marked by rapid growth and increased efficiency. More beds were added to the wards, but it was not until 1906 that any adequate extension was possible. In that year the Ethel Pain Memorial Hospital was completed. This hospital contains four very fine wards, a well equipped operating theatre, and accommodates fifty women and children. In 1912 a second story was added to the men's hospital which contains a fine operating theatre. It may be said that during the past few years the Old Cairo Medical Mission has made great strides ahead. Its accommodation has been increased by the addition of two spacious wards to the rear of the men's hospital, joined to the original building by a corridor. A convenient ophthalmic consulting room, and operating theatre have been added to the dispensary, the medical and nursing staffs have been increased and various improvements have been made both in equipment and accommodation. This hospital is not only selfsupporting, but it has largely contributed to the support of other missionary work. Over eight thousand cases of ankylostomiasis have been admitted, and several thousands of bilharzia cases have been treated by intravenous injections. Surgically much good work has been done, including a number of cases of Egyptian splenomegaly, nephrolithotomy and other serious operations. The hospital now has one hundred and fifty beds and more than eight hundred mats. The model at the exhibition most beautifully made was the work of Dr. R. B. Coleman, one of the medical officers of the hospital, and it was he who gave these details to your correspondent.

The model of Mengo Medical Mission is another splendid example of the artist's craft and was done by Dr. E. N. Cook, one of the staff. The Mengo Medical Mission compound is situated in Uganda and consists of a negro hospital, a white man's hospital, a hospital for Indians, a pathological laboratory, an x ray department, and a maternity Home and Training School. In this training school native girls are instructed in midwifery. Dr. A. Cook founded the mission and is still in charge.

The model of the hospital at Pakhoi, China, was made by a Chinese mandarin and is perfect in every detail. It includes a large leper asylum, and contains two hundred and ten beds, with its general wards and maternity home. It is interesting to know that injections of the acids of chaulmoogra oil have been employed in the institution in the treatment of leprosy with considerable success. At the present time there is no doctor in this hospital and it is in charge of a nurse. There was a model of a hospital at Peshawar in which it was stated there was a very marked increase of major operative surgery.

The Church Missionary Society has now thirty-seven mission hospitals working at strategic centres in the mission field. Several of these are surrounded by a ring of branch dispensaries and a few have an outer circle of welfare centres. All the thirty-seven contribute more or less extensively towards their own support. Five of the mission hospitals have medical schools attached to them. There are leper establishments in connection with four of them, and leper work is being started in a fifth. Building, rebuilding, or enlargement is taking place in ten of them. Eight are fitted up with up to date x ray equipment in working order, three have full laboratory and bacteriological facilities, and the majority have partial equipment for pathological research. These thirty-seven hospitals at the present time have an aggregate of 4,275 beds, an increase of accommodation of 150 beds during the past year. To staff these hospitals there is a nominal strength of seventy-five doctors and eighty-five nurses. Seventeen of the hospitals are in charge of one doctor only, and five have no doctors at all, being in charge of nurses. Carefully prepared tables show that there are needed twenty-six men doctors, six women doctors, twenty-five nurses, and two chemists to bring the staff up to the minimum of efficiency.

* * *

A Congress of Radiology and Physiotherapy was held in London on June 7th to 10th. The meeting was largely attended and there were several French and Belgian authorities present, some of whom read papers. Among the interesting papers presented those dealing with deep therapy by x rays and radium attracted great attention, in view of the discussion as to their value which has been going on for some time and certain differences of opinion on this point which prevail among experts. Dr. Caseman, of Antwerp, opened the discussion and said in part that it must never be forgotten that radiation could not be used when pathological cells became less sensitive than normal cells. He thought the crossfire method unnecessarily limited the field of radiation. He suggested the use of a rectangular diaphragm with a wide field and a dose sufficient to destroy the entire neoplasm. In the determination of the x ray exposure required, it was necessary to know the depth of the pathological centre and the dose required by it. The biological unit generally accepted was that amount of radiation which would produce on normal skin a slight erythema in a few weeks followed by a mild pigmentation in six weeks. The radiation at any given depth depended partly on the "back scattering" and therefore on the nature of the irradiated tissue. Roughly speaking, water and human tissue behaved similarly to radiation when the pelvis was considered, but this would not be true for the thorax.

Dr. R. Knox said in part that the problem of deep therapy radiation was too deep and elusive to be solved easily. The Erlangen method differed so far as actual technic was concerned in having six skin areas, each being directed to a definite deep area. Both the Freiburg and Erlangen methods in which the fields were limited and in which several were used for deep seated carcinoma of the pelvic organs necessitated a considerable overlapping of the beams and a considerable risk to adjacent and healthy organs. The effects on the blood would have to be more carefully considered. The work at the cancer hospital had resulted in the construction of a rotating tube method in which the maximum dose is delivered at a predetermined spot, the skin receiving but a fraction of the depth dose. It was later found necessary to modify the method by slowly rotating the patient instead of the tube so that efficient protection could be determined. Dr. Knox thought the erythema of the skin a most unsatisfactory factor upon which to base an estimation of the effects on deeper structures. It was well known that many forms of carcinoma required three or four times the socalled lethal dose before any change could be induced in the morbid process. In radiation we possessed a useful aid in the treatment of malignant disease, particularly for the amelioration of suffering and the relief of symptoms. All efforts should be made to carry on the investigations into the biological reactions induced by its application.

Mr. Sampson Handley called for closer cooperation between radiologist and surgeon, who were interdependent. As a pathologist he wished again to draw attention to the previous demonstration of a narrow growing edge visible by means of the microscope, considerably beyond the visible signs of disease. Malignant disease undoubtedly spread in the plane of the deep fascia and not in the skin. This both called for wider fields of treatment and added to the difficulty of getting a lethal dose at the required depth. There was always to be remembered the possibility of the microscopic growing edge receiving a stimulating dose of radiation where much harm might be done. Radium tubes were advocated when placed beyond the growth—encirclement method. Similarly, lupus was not a true skin disease but spread in the deep fascia. The lethal dose was required there and naked eye manifestations of the skin should receive less consideration.

Dr. Hayward Pinch, director of the London Radium Institute, regarded deep radium therapy to mean treatment with a screen of not less than one mm. silver which would eliminate ninety-nine per cent. of the beta rays. There were three methods of deep radium therapy: 1. Heavily screened external application; 2, buried radium, salt or emanation; and 3, combination of methods 1 and 2. The first method was wasteful but obviously necessary in mediastinal growth and tumors of the cerebellum for example. It was further advisable in malignant disease of the thyroid and of the parotid gland if any secreting gland remained. With regard to buried radium tubes, if the growth were not greater than three c. mm. in diameter, one tube with one mm. silver filtration of suitable size and shape should be used, otherwise several small tubes. Wherever possible the afferent vessels and lymphatics should in addition be radiated with surface application. As adjuncts to radiation, Dr. Pinch suggested: 1. A liberal vitamine B diet as this lessened the lymphopenia. 2. Intramuscular injections of colloidal copper or silver solutions. Lastly, radium should always be assisted by x rays. In connection with the congress two associated exhibitions of x ray apparatus and radiograms were held.

Acknowledgement is made to the editor of the *Lancet* from whom the greater part of the information concerning the congress was obtained.

Book Reviews

A HANDBOOK OF OBSTETRICS.

Manual of Obstetrics. By John Osborn Polak, M. Sc., M. D., F. A. C. S., Professor of Obstetrics and Gynecology in the Long Island College Hospital; Professor of Obstetrics, Dartmouth Medical School; Obstetrician and Gynecologist to the College Hospital, etc. With Three Color Plates and One Hundred and Nineteen Illustrations in Text. Second Edition, Containing a Special Section on Endocrinology. New York: Physicians and Surgeons' Book Company, 1922. Pp. xix-488.

This is the second edition of a manual of which it seems that there are already too many in existence. It is really questionable whether such handbooks, intended as royal roads to learning for "the student and the busy practitioner" serve any useful purpose. The author in his preface offers it as a "systematic introduction to the more elaborate treatises, to serve as a guide in following the didactic and practical teaching given in the college course." There may possibly be some excuse for a book of this sort for a second year medical student, but surely the more advanced student and especially the postgraduate student and the busy practitioner have need of something more than the very elementary treatise here presented. Such books have a tendency toward the development of slovenly methods of acquiring knowledge which may be called half baked. Polak's manual is little more than an outline of the subject of obstetrics. The arrangement of the titles, subtitles and the use of italics makes reference easy. The chapter on reproduction and especially the one on organology are quite extensive and very lucid. They are also excellently arranged so as to be of value in explaining those conditions and diseases that have malformations and maldevelopments as their basic cause. The two special chapters are devoted to the theory of the application of the endocrine products in pregnancy, labor and the puerperium, but specific directions for treatment and dosage are omitted. A bibliography would be a valuable addition.

VERSION IN OBSTETRICS.

The Place of Version in Obstetrics. By Irving W. Potter, M.D., F.A.C.S., Buffalo. Obstetrician in Chief, Deaconess Hospital and St Mary's Maternity Hospital; Attending Obstetrician, City Hospital, etc. With Forty-two Illustrations. St. Louis: C. V. Mosby Company, 1922. Pp. 138.

This monograph describes a method of internal podalic version developed by the author himself. For a long time version has been considered an emergency operation on occasions when forceps failed or were unavailable, and the generally practised technic of version is anything but satisfactory. It is the author's aim to popularize this technic and to urge its more frequent application. With increasing practice, the technic became standardized. He found that pressure exerted over the fundus of the uterus, as often recommended, is not only unnecessary but also dangerous, as it frequently leads to the extension of the child's arms over the head during delivery and other difficulties. As the indications for this procedure were increased, the puerperium was found to have a smooth course and the morbidity and suffering of the mother were decreased. At the present time the author uses version in ninety per cent. of his cases; the last 938 cases, including all kinds of complications, showed no maternal mortality and a fetal mortality of 2.3 per cent.—a remarkable record. With the aid of version the second stage of labor is eliminated, together with the usually resulting suffering and torn or relaxed perineum; the delivery is completed within an hour and the physician is not exhausted. This is the result of the author's perseverance in the face of severe criticism and even personal abuse, for which he deserves much credit.

The first two chapters, comprising almost half of the book, review the early history of version including that of the nineteenth century and excerpts are quoted from the most prominent authors, showing the opinions held at various times of this procedure. The present trend of obstetrical teaching is to consider version as a difficult and dangerous operation to be undertaken only in extreme emergencies; this the author deprecates and for it he blames inadequate teaching in the medical schools.

Potter still favors the use of chloroform for anesthesia, a procedure which is condemned by many as unsafe and capable of producing serious damage to the maternal viscera, especially in the hands of the inexperienced or careless administrator. Every step of the technic is carefully and suitably illustrated. The subject is presented in a forcible and convincing style and proves excellent reading. The practice of presenting subjects in monographs patterned after the style of this one deserves emulation.

DISEASES OF WOMEN.

Diseases of Women. By Ten Teachers. Under the Direction of Comyns Berkeley, M. A., M. D., M. C. (Cantab.), F. R. C. P. Lon.), Obstetrical and Gynecological Surgeon to the Middlesex Hospital, etc. Edited by Comyns Berkeley, H. Russell Andrews, J. S. Fairbairn. Illustrated. Second Edition. New York: Longmans, Green & Co., 1922. Pp. xi-641.

Conjoint authorship seems to be the latest fad in English publications. The ten teachers who were the authors of this book are H. Russell Andrews, J. D. Barris, Comyns Berkeley, Victor Bonney, Harold Chapple, G. F. Darwall Smith, Stanley Dodd, J. S. Fairbairn, T. G. Stevens and Clifford White, who also wrote its companion book "Midwifery." Although the various subjects were originally assigned to particular authors, each subject was finally reviewed by the whole body, thereby overcoming the disadvantages of collective authorship, and the final product eventually represented the views of all. The reasons for differences of opinion the student is left to unravel for himself.

In regard to therapy, the statements regarding dosage are frequently vague or entirely lacking, especially with reference to the endocrine products. In a textbook intended for medical students, instructions as to the dosage of drugs should be specific. Patent medicines are occasionally recommended, such as antikamnia, a practice that seems to run counter to our own ethical standards. Frequently treatment is referred to the companion book *Midwifery*, which, to say the least, seems unfair. The impression is given that ichthyol is a panacea in almost every form of gynecological disease.

The subject of the venereal diseases is discussed with the purpose of emphasizing the preventive aspect of state medicine and many abstracts from the report of the Royal Commission on Venereal Diseases are cited. The method of treating the subjects of gonorrhea, syphilis and chancroid is inadequate, as it merely scratches the surface, especially in the matter of therapy. Giving an anesthetic for the treatment of gonorrhea seems extreme.

The topic of extrauterine pregnancy is treated very satisfactorily and gives the student the proper point of view. Urinary and intestinal disorders, respectively, are treated as separate entities. The section dealing with the psychological factor in its relationship to the diseases of women, a subject usually not extensively discussed in textbooks on gynecology, should be a great aid in the better understanding of this important subject, too often neglected under the name of neurasthenia.

The surgical technic of gynecological operations constitutes a separate section, an arrangement that is not as good as that of adding the operative treatment indicated at the end of the description of each disease. Instead of describing the surgical technic, merely a general description of what should be done is given at the end of the chapter. The most recent operative technics are not given.

The book on the whole creates an impression of dogmatism, which is probably a good way of presenting a subject to students. Bibliographies were omitted, although it is now an almost universal practice to include them. An air of conservatism pervades the whole work.

TEXTBOOK OF OBSTETRICAL NURSING.

Obstetrical Nursing. A Textbook on the Nursing Care of the Expectant Mother, the Woman in Labor, the Young Mother and Her Baby. By CAROLYN CONANT VAN BLARCOM, R. N. With Two Hundred Illustrations and Eight Charts. New York: The Macmillan Company, 1922. Pp. xxiv-558.

This textbook on nursing is of great value. It is the most complete book of its kind that has come within the province of the reviewer. Great attention is bestowed upon minor details, which are of major importance. Physicians whose work takes them into the field of obstetrics would profit by reading this book, for they would then be able to instruct their nurses in a concrete way instead of leaving general orders. The author has realized the import of the psychic state of the mother during the period of gestation, labor and puerperium and also the need for a state of harmony and rapport between physician, nurse and patient. These, it is proved, may best be secured by careful training and understanding on the part of the nurse. American, English and Canadian schools of nursing are studied and the best these have to offer are selected with commonsense and presented in this work. Twenty years of active work are embodied in the experience of the author. Hospital and home conditions are considered, and while general plans of procedure are followed, there is enough leeway given to make these adaptable to any complications or circumstances.

OBSTETRICS FOR MIDWIVES.

Synopsis of Midwifery. By ALECK W. BOURNE, B. A., M. B., B. Ch. (Cantab.), F. R. C. S. (Eng.), Obstetric Surgeon to In-patients, Queen Charlotte's Hospital; Obstetric Surgeon to Out-patients, St. Mary's Hospital, London. Second Edition. New York: William Wood & Co., 1921.

This handbook fulfills in an admirable way the purpose of its author, which is to provide in a clear, concise and compact form the principal points in obstetrics upon which the student preparing for an examination should be informed. No attempt is made to supplant the standard textbooks on obstetrics. The second edition of this work has been enlarged by the addition of new matter, particularly on the toxemias of pregnancy and the hemorrhages of pregnancy and labor. The newer methods of treating these conditions have been incorporated, and in fact all the sections on treatment have been given more in detail in order that the work may prove of use to the general practitioner as well as to the student, both of whom will find it valuable in revising their knowledge of the essentials of obstetrics.

GYNECOLOGY AND MIDWIFERY.

Geburtshilflich-gynäkologische Propädeutik. Eine theoretische und praktische Einführung in die Klinik und in die Untersuchungskurse. Von Prof. Dr. OSCAR POLANO, vorstand der Eynäkologischen Universitäts-Poliklinik, München. Third and Fourth Editions. Leipzig: Curt Kabitzsch, 1922. Pp. 195.

This work appeared originally in 1914 as a 150 page volume. It has now expanded to 195 pages with 96 illustrations, for the most part colored. As its title tells it is an introduction to the double subject of midwifery and gynecology. There are six chapters on anatomy and physiology, including the anatomy of the pelvis, and one each on the anatomophysiology of gestation, physiology of labor, and physiology of the puerperium. The remainder of the book is devoted to the obstetrical and gynecological examinations, technic, including bacteriology and röntgenography. The scope of the book is somewhat out of the beaten track. Just what added or special values it possesses for teaching must of course be left to the test of experience, but the basic plan seems wholly along the lines of economic efficiency.

BACTERIOLOGY.

Compend of Bacteriology. Including Pathogenic Protozoa. By ROBERT L. PITFIELD, M. D., Pathologist to the Germantown Hospital; Late Demonstrator of Bacteriology at the Medico-Chirurgical College, Philadelphia, etc. Fourth Edition. With Four Plates and Eighty-two Other Illustrations. Philadelphia: P. Blakiston's Son & Co., 1921.

This compend is designed to meet the needs of the student preparing for examination. The minute details of cultures and technic are not given, so the book will not be very useful to the laboratory worker. But for the practitioner of medicine, the nurse, or the student who wishes to become acquainted with the principal facts of the science of bacteriology without the expenditure of much effort, the author has provided a readable and well illustrated little book. This edition contains chapters on filterable viruses, contributed by Dr. Herbert Fox, and new matter has been added throughout the book.

IDEALISM.

The New Idealism. By May Sinclair. New York: The Macmillan Company, 1922. Pp. xvi-333.

Here we have to deal with a charming presentation of a philosophical egocentric anarchy. Truth there may be of as many colors as there are observers, a valid truth for each according to his perceptions, unmindful of corroboration or contradiction. According to our new idealism the psychotic is sane or insane according to his own diagnosis or he has as many sanities as the individual opinions of his many observers. This may be a convenient if a somewhat confusing philosophy, comforting if not correct. Pragmatism, vitalism or any other constructive philosophy is deftly shunted to limbo. The idealist, so May Sinclair assures us, has little concern with how things really are, his main interest being in how they appear—to him. This then is a philosophy which allows for too much error and too much phantasy. If this is to be called philosophy we should at least qualify and let it be known as fictive philosophy. It is a socalled philosophy which allows for no growth and does not consider differences of experience or knowledge among various persons.

In spite of these drawbacks we are indebted to May Sinclair for a clear, impartial, and convincing analysis and critique of realism. Of especial interest are her presentations of space—time and deity. She has also presented the case for idealism with brilliancy. Defenders it surely requires. The charm of her writing is as evident here as in her fiction. If more writers in this arid world of philosophy would cultivate the clarity which is found in this book the entire subject would be less boresome and more instructive. If Miss Sinclair's next contribution to the subject of idealism excels *The New Idealism* in the same degree as this is an improvement over her *Defence of Idealism* it will be well worth consideration. For the present, however, the reviewer opines that there is more sound philosophy in *The Life and Death of Harriet Frean* than in either of the more frankly philosophical contributions.

JOANNA GODDEN.

Joanna Godden. By Sheila Kaye-Smith. New York: E. P. Dutton & Co, 1922. Pp. 353.

Society will not tolerate individualistic supremacy, except in rare cases in which the individual is great enough—or clever enough—to subordinate his personal aims to the purposes of society. Dr. Constance Long, the well known British psychiatrist, puts this thought exceptionally well in a recent paper on Psychological Adaptation, in which she writes: "The individual person differentiates himself from what is customary and average, and is only approved when he has given to society in exchange for the exemptions, licenses, or heresies through which he has established his freedom."

The novel, *Joanna Godden,* illustrates the working out of this hypothesis in the development of the two sisters, Joanna and Ellen. Left orphans, Joanna, the elder, assumed the place of mother and lovingly tyrannized over Ellen, even to the extent of marrying her off after her return from boarding school to a man she did not love—an unhappy match culminating in Ellen's going to the continent as the mistress of an elderly reprobate. Her subsequent disillusioned return to the village from this escapade, which had been kept a secret, only stimulated the curiosity and interest of the villagers, and later Ellen, the wary, discreet and artful, seeing little in real values if appearances were preserved, attained distinction by conforming to collective opinion and gaining collective approval, finally marrying the "catch" of the countryside. Joanna, on the other hand, sincere and genuine, absolutely incapable of untruth, with all the beauty of person and wholesomeness of nature that should come from good heredity, healthful living and outdoor occupation, was considered by her neighbors as greatly inferior to her sister. Her unpopularity was increased by her steady, independent march to success and prosperity, which finally elevated her sheep farm to the proud position of the manor of the countryside. For Joanna was ambitious, practical, and intelligent, and possessed an excellent head for business. Also, upon occasion, she could be headstrong, domineering and scornful. None of the young farmers of the vicinity wanted to marry a "highflyer who had never been praäperly broken in," and the one man who was able to appreciate her met a sudden death, so Joanna remained unloved and unwed. But the story ends with at least partial compensation promised for the future.

The mutual sustaining of each other by plot and characterization is cleverly worked out by the author. The style is simple and direct, so that the story tells itself, and the psychology of the characters is based on a thorough knowledge of and real sympathy with human nature. The book certainly sustains Miss Kaye-Smith's position as one of the foremost of British novelists.

BRINGING UP CHILDREN.

The Child and the Home. Essays on the Rational Bringing Up of Children. By Benzion Liber, M. D., Dr. P. H,. Editor of *Rational Living.* New York: Rational Living, 1922. Pp. 256.

It is difficult for a firm believer in the rational bringing up of children to form an impartial opinion of this book. The reviewer is fortunate in knowing only that kind of bringing up. Consequently to him there is much in the book that seems obvious and selfevident. If these essays will undermine the foundation of families whose creed is, "What was good enough for father is good enough for me!" they will have accomplished a great and needed work. Countless potential brains have been crushed by bourgeois mediocrity that could not conceive of the future being better than the past. The families who still "bring up" their children will undoubtedly need the aid of the skilled medical man to unravel their problems. We trust that they may fall into the capable hands of some such educator of Dr. Liber, either in person or figurative speaking through his book. To them his message will appeal and strike home. To us who are already coworkers and feel that the child brings up the parent more skilfully than ever parent could guide child, the book serves as an illuminating comment on a firmly rooted conviction.

Medicoliterary Notes.

The recently issued annual report for 1921 of the Central Indiana Hospital for the Insane at Indianapolis contains an interesting section on the very full course in psychopathology being conducted at that institution. This course is open without charge to practitioners and students of medicine, including officers and members of the county medical societies of the state. Since 1893, the date of the incumbency of the present superintendent, Dr. George F. Edenharter, this institution has strongly advocated the principle that every state hospital should have two functions: 1, that of an institution for observation, research, care and treatment of mental diseases; 2, that of a part of a general scheme of community service for the prevention of such disorders through public education in mental hygiene, for the holding of mental clinics, and as a teaching hospital.

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Better Letters is the suggestive title of a pocket-sized volume recently published by the Academy Press, Wyoming, N. Y., giving in very brief, yet most practical form, valuable suggestions and information about business correspondence. The secretary or stenographer of every physician should have a desk copy.

* * *

The Forty-fourth Annual Report of the Jefferson Hospital, Philadelphia, states that during the past year 8,647 patients were treated at the hospital. The out patient department handled 32,381 persons, and the emergency ward gave first treatment to 16,000.

* * *

According to the records of thirty-seven insurance companies, 1921 was the healthiest year in the histories of the United States and Canada. This was due to a reduction in the number of influenza and pneumonia cases. Suicides and homicides, automobile accidents and recorded deaths from cancer were more numerous than in 1920.

* * *

The recently published annual report of the Collis P. Huntington Memorial Hospital for Cancer Research and of the Laboratories of the Cancer Commission of Harvard University announces as the two most notable features of the year's work the perfection of an elaborate new x ray machine by William Duane, Ph. D., and the completion of the new laboratory building.

* * *

My Boyhood, by the good gray naturalist, John Burroughs, with a conclusion by his son Julian Burroughs, and most attractive illustrations, is a restful yet entertaining volume recently published by Doubleday, and delightful reading for a Sunday afternoon in summer.

* * *

At a recent session of the Economic Council of Poland, the Government definitely guaranteed to assume the responsibility to feed 400,000 children from June 1 to October 1, 1922, and 300,000 children from October 1, 1922, to June 1, 1923. Free transportation is being provided to American Relief Administration supplies across Poland, as well as free warehousing of foodstuffs at Danzig.

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The United States Public Health Service is sending out three times weekly public health messages from the Naval Laboratory Air Craft Station, NOF, Anacosta, D. C.; these messages have been heard as far west as Kansas. This method of broadcasting marks a distinct step in public health education. It is reported that answers have come back to "NOF" from thousands of radio operators, including very young boys, illiterate persons, railway magnates and bank presidents.

New Publications Received.

THE PSYCHOLOGY OF MEDICINE. By T. W. MITCHELL, M.D. New York: Robert M. McBride & Company, 1922.

THE OUTCAST. By SELMA LAGERLOF. Garden City, New York and Toronto: Doubleday, Page & Company, 1922. Pp. vi-297.

TRANSACTIONS OF THE AMERICAN SURGICAL ASSOCIATION. Volume XXXIX. Philadelphia: William J. Dornan, 1921. Pp. liii-779.

GENTLE JULIA. By BOOTH TARKINGTON. Garden City, New York and Toronto: Doubleday, Page & Company, 1922. Pp. 375.

ETUDE DE L'EVOLUTION DES ADENOPATHIES HILAIRES TUBERCULEUSES. Par Dr. MARCEL PAILLET. Paris: Jouve & Cie, Editeurs, 1922. Pp. 60.

OUR ELEVEN BILLION DOLLARS. Europe's Debt to the United States. By ROBERT MOUNTSIER. New York: Thomas Seltzer, 1922. Pp. 149.

THE NEWER KNOWLEDGE OF NUTRITION. By E. V. McCOLLUM. Second Edition. New York: The MacMillan Company, 1922. Pp. xviii-449.

A MANUAL OF CLINICAL LABORATORY METHODS. By CLYDE LOTTRIDGE CUMMER. Philadelphia and New York: Lea & Febiger, 1922. Pp. xviii-484.

THE PRACTICE OF AUTOSUGGESTION. By the Method of EMILE COUE. By C. HARRY BROOKS. New York: Dodd, Mead and Company, 1922. Pp. 119.

INFLUENZA: ESSAYS BY SEVERAL AUTHORS. Edited by F. G. CROOKSHANK, M.D. (London), F. R. C. P. London: William Heinemann, Ltd., 1922. Pp. 529.

HYPERPIESIA AND HYPERPIESIS (HYPERTENSION). By H. BATTY SHAW. Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1922. Pp. x-191.

THE CLINICAL METHOD IN THE STUDY OF DISEASE. By R. M. WILSON. Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1922. Pp. xii-57.

MENTALLY DEFICIENT CHILDREN. By G. E. SHUTTLEWORTH and W. A. POTTS. Fifth Edition. Philadelphia: P. Blakiston's Sons & Co.; London: H. K. Lewis & Co., Ltd., 1922.

HANDBUCH DER MIKROBIOLOGISCHEN TECHNIK. Herausgegeben von Prof. Dr. RUDOLF KRAUS und Prof. Dr. PAUL UHLENHUTH. Berlin and Wein: Urban & Schwarzenberg, 1922. Pp. 532.

THE OXFORD INDEX OF THERAPEUTICS. Edited by VICTOR E. SORAPURE. Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1922. Pp. xvi-1126.

THE PRINCIPLES OF ELECTROTHERAPY AND THEIR PRACTICAL APPLICATION. By W. J. TURRELL. Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1922. Pp. xi-276.

WIENER ARCHIV FUR INNERE MEDIZIN. Geleitet von W. FALTA und K. F. WENCKENBACH. IV. Band, 1 Heft. Mit 5 Abbildungen und 29 Kurven im Text und 9 Tafeln. Berlin and Wien: Urban & Schwarzenberg, 1922. Pp. 189.

Practical Therapeutics

NOTES AND STATISTICS ON TWILIGHT SLEEP.

By H. M. Gerson, M. R. C. S., L. R. C. P.,

London.

The following notes are a résumé of my experiences in seventy-five cases conducted under twilight sleep from May to December, 1920. Records were kept of every symptom and sign, dose being charted at the time given. Where possible, and when patients were seen early enough, pelvimetry was carried out and the usual antenatal procedures were adopted. No patient was advised against treatment on medical grounds though many might have been considered to hold out contraindications by advanced pulmonary tuberculosis, heart disease, or other conditions. The methods of Professors Kronig and Gauss were used as my basis and additional details and variations gleaned from practical experience may be worthy of record.

TECHNIC.

I was informed at once when labor set in, an abdominal examination only was made, the patient was told that her pains would increase in intensity and she was asked to call as soon as they became actually uncomfortable. When the patient was of nervous temperament I relied upon the regularity and intervals of pain (seven minutes) rather than dilatation of the os, and commenced treatment without any vaginal examination.

In the case of multiparæ I commenced treatment as soon as labor definitely set in, always making certain that the pains were those of labor and never relying upon the nurse or patient for such information. Before giving the first injection, viz., one one hundred and fiftieth gr. of scopolamine and one third gr. of morphine made up in a single ampoule, the bedroom was arranged, windows opened, but light excluded, all swabs, instruments, dressings and other material were removed from the room only to be brought in when the patient was narcotized. Dexterity in giving the first injection was an important factor in gaining the confidence essential while the patient was in the conscious state, and was followed by a remark to the effect the only painful part of the treatment was now over.

A second injection of one one hundred and fiftieth gr. scopolamine alone was given in one hour's time and true amnesia was not obtained until a further three quarters of an hour had elapsed and in certain cases this period was even longer. Further doses were as in typical cases described below.

The true state of amnesia can be recognized by means of memory tests such as those generally practised by the Freiburg school, viz., showing the patient familiar objects asking her to recognize them later, her inability to do so being a criterion of the degree of amnesia. In my experience, however, these proved not only unnecessary but disturbing to the patient; after treating a certain number of patients the recognition of this state became almost instinctive.

As will be gathered from the statistics below the percentage of complete amnesia in primiparæ is high in comparson with multiparæ, owing to the fact that the latter were seen too late in labor for the action of the drug to be effective. The figures for incomplete amnesia refer to those cases where the patient emerged from the narcotic state sufficiently to be conscious of her surroundings. This emergence indicated the repetition of morphine (quarter gr), whereby complete amnesia was reinstated but at the sacrifice of a certain amount of intensity of uterine contraction. This in its turn was regained by small doses of pituitary extract.

On the day after the delivery I confirmed my observations by interrogating the patient and her recollections of trivial incidents were found to coincide with the time of incomplete amnesia. Analgesia was always complete irrespective of the degree of amnesia.

USE OF FORCEPS.

Forceps have been applied in many cases owing to delay late in the second stage. There is no doubt that the action of the drug in several cases lessened the force of uterine contraction to such a degree as to necessitate the employment of the following methods: Stimulation of the uterus by abdominal massage and pressure; putting on a binder; emptying the bladder; giving enemata; making vaginal examinations; retracting the perineum manually. If these methods failed to intensify uterine contraction I gave small doses of pituitary extract (fifteen c. c. to one c. c.).

EFFECT OF TREATMENT ON THE CHILD.

One of the main objections to this method of delivery would seem to lie in the condition of the child at birth. Oligopnea, in my experience, seems to occur more frequently than in unaided labor although in none of my cases of infant mortality can I attribute death to this cause. I undoubtedly found it advisable in every case to exercise a certain amount of vigilance until the child gave a healthy prolonged cry. In eight cases I found it necessary to resort to artificial respiration, attended in each case with successful results. I found that oligopnea occurred more frequently in labors of short duration than when delivery took place shortly after an early injection.

Regarding the aftereffect upon the mentality of the child I have little to remark except that in following up my cases I found the mortality in the first year nil and the mentality as far as one could judge normal.

HEMORRHAGE.

In no case did I find any appreciable alteration in the amount of hemorrhage. In one case the patient voluntarily informed me that she was impressed with the diminished amount of hemorrhage as compared with her former and ordinary confinement.

PUERPERIUM.

In no case was there any complication and every patient was allowed to get up on the tenth day with no untoward result. Many a patient undertook a long journey on the fourteenth to seventeenth day.

Case I.—Dose recorded in two typical primiparæ occurring simultaneously. Labor pains commenced six hours before first injection. Os in each case dilated two fifths; pains regular, five minute intervals.

	Injection		*Case* 16 *Time of Injection*	*Case* 17 *Time of Injection*
1.	1/3 gr. morphine	1/150 gr. scopolamine	5:00 a. m.	5:30 a. m.
2.		1/150 gr. scopolamine	6:10 a. m.	6:15 a. m.
3.		1/150 gr. scopolamine	8:55 a. m.	8:40 a. m.
4.	1/4 gr. morphine	1/150 gr. scopolamine	11:55 a. m.	11:15 a. m.
5.		1/450 gr. scopolamine	12:25 a. m.	12:20 p. m.
6.		1/450 gr. scopolamine	1:35 p. m.	1:30 p. m.
7.		1/450 gr. scopolamine	2:45 p. m.	2:40 p. m.
	Birth	....	3:30 p. m.	3:35 p. m.

Case II.—Dose recorded in a typical multipara. Labor commenced three and a half hours before first injection. The os was dilated one fifth, pains regular, seven minute intervals.

	Injection		*Case* 56
1.	1/3 gr. morphine	1/150 gr. scopolamine	3:30 a. m.
2.	1/4 gr. morphine	1/150 gr. scopolamine	4:15 a. m.
3.		1/150 gr. scopolamine + 1 c.c. pituitary	7:00 a. m.
4.		1/150 gr. scopolamine	10:00 a. m.
5.		1/150 gr. scopolamine	12:55 p. m.
	Birth	....	2:40 p. m.

Case III.—A special case of induction of labor under twilight sleep, primipara, aged thirty-three, urine one hundred per cent. albumin, general edema, labia so swollen as to suggest danger of obstruction.

	Injection		*Time*
1.	1/3 gr. morphine	1/150 gr. scopolamine	9:05 p. m.
2.		1/150 gr. scopolamine	10:00 p. m.
3.			12:00 p. m.
4.			8:45 a. m.
5.			10:30 a. m.
6.	5 c.c. pituitary extract		10:40 a. m.
7.			12:05 p. m.
8.	5 c.c. pituitary extract		12:30 p. m.
9.	1/450 gr. scopolamine		1:30 p. m.
	Birth	....	2:00 p. m.

METHODS OF INDUCTION.

12 p. m.: The patient was given a whiff of chloroform, the vagina packed with gauze, and a T binder put on. 8:45 a. m.: The patient was given another whiff of chloroform, and the os was dilated with the fingers until it was two fifths. 10:30 a. m.: Another whiff of chloroform was given and the de Ribes bag inserted. 12:5 p. m.: The bag was reinserted owing to leakage; os then four fifths. 2 p. m.: Forceps were applied, and a female child was delivered, stillborn, weighing six pounds, seven ounces.

The patient made a good recovery, edema subsiding and urine clear again three weeks following delivery.

TABLE I

Statistics of Seventy-Five Cases Delivered Under Twilight Sleep

	Primiparæ	*Multiparæ*
Number of cases.......	48	27
Maternal mortality	Nil	Nil
Infant mortality	2	1
Average duration of labor.........	20 1/2 hours	13 hours
Average duration of twilight sleep.	11 1/3 hours	7 1/4 hours
Average period of labor before first injection	9 1/6 hours	5 3/4 hours
Average number of injections......	2	4.2
Maximum number of injections....	12	10
Minimum number of injections.....	2	2
Complete amnesia	45	18
Incomplete amnesia	3	8
Amnesia unobtainable in one case..	..	1
Instrumental delivery	28	2

Radium in Gynecology.—H. O. Jones (*Surgery, Gynecology and Obstetrics,* October, 1921) reports a series of cases treated with radium in the gynecological service of St. Luke's Hospital and presents the following summary: 1. In selected cases of uterine fibroids in women near the menopause radium controls the bleeding and causes contraction of the tumor in about ninety per cent. of cases. 2. Radium is practically specific in the bleeding of the menopause; idiopathic uterine hemorrhage is controlled in a majority of cases. 3. In carcinoma radium is a palliative agent of the greatest merit; as a curative agent it ranks at least the equal of other methods of treatment. 4. Chronic leucorrhea yields satisfactorily to radium treatment.

Treatment of Cancer of the Cervix.—H. Okabayaski (*Surgery, Gynecology and Obstetrics,* October, 1921) gives the following results from the use of his technic for radical abdominal hysterectomy in cancer of the cervix: 1. The technic which he uses is quite different from other methods employed in treating cancer of the uterus. 2. With his method any case of cancer of the uterus, whether in a very advanced stage or in a primary stage, can be operated upon very satisfactorily. The dangers and sources of failure which occurred in his earlier operations with the Wertheim method have almost disappeared. 3. The control of bleeding is the most difficult problem in the radical abdominal operation, because in the radical operation the parametrial tissue is widely extirpated. His method renders extirpation easy and bloodless, even though the parametrium is extensively infiltrated with cancer and though one excises the tissue near the pelvic floor. 4. With improvement in the operative technic the operability percentage has been raised and primary mortality has decreased. 5. He hopes to be able to report much better results next year, when his cases will have passed the five year period. So far the results have been very satisfactory. He feels that the method described has not been perfected in all particulars, but he believes that it is one of the most perfect that has been designed for the treatment of cancer of the cervix of the uterus. If good results in the treatment of cancer of the cervix are secured with this method, it will bring great happiness to women. The honor for perfecting the technic he says naturally belongs to his teacher, Professor Takayama, and it is to give credit to him that the operation has been described.

Radium Treatment in Carcinoma of the Uterus.—W. Kohlmann (*Surgery, Gynecology and Obstetrics,* September, 1921) concludes as follows:

1. The uterus together with the tubes and ovaries can be clearly shown by pneumoperitoneal röntgenography.

2. Owing to their distention with gas the tubes are rather more clearly demonstrated by the x ray where inflation has been brought about through the transuterine route than where the inflation has been made transperitoneally.

3. On account of the rapid absorption of carbon dioxide gas with equally rapid subsidence of the discomfort produced by the inflation, this gas should be used in preference to oxygen which is very slowly absorbed.

4. Irregularities of the uterus, omental and bowel adhesions are clearly demonstrated by pneumoperitoneal x ray.

5. In not a few instances the diseased and enlarged appendages are more clearly made out by pelvic röntgenography than by the most careful and searching bimanual examination, even under anesthesia.

6. With the improved position (knee chest and Trendelenburg) smaller and smaller quantities of gas will be necessary for inflation. Thus discomfort will be reduced to a minimum.

7. If the technic of pelvic röntgenography be good, retention of bowel coils in the pelvis will be proof of adhesions.

8. The pneumoperitoneal x ray is able to demonstrate pregnancy at a much earlier period than is possible by the examining finger.

9. With good technic and good judgment in the selection of cases both transuterine and transperitoneal gas inflation are free from danger.

10. Bimanual pelvic examination and pelvic pneumoperitoneal röntgenography are not antagonistic diagnostic methods. Each is valuable and their value is enhanced if used in conjunction, each acting as a check upon the other.

Proceedings of Societies

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS AND ABDOMINAL SURGEONS.

Thirty-Fourth Annual Meeting, Held at St. Louis, Missouri, September 20, 21 *and* 22, 1921.

The President, Dr. Henry Schwarz, of St. Louis, in the Chair.

Diabetes and Pregnancy.—Dr. John N. Bell, of Detroit, said that a more careful prenatal history should be taken of all obstetrical patients. A blood sugar estimation should be made in all cases where symptoms of diabetes were present, regardless of the presence or absence of glycosuria. A fair trial of the newer forms of treatment should be instituted before terminating the pregnancy.

Heart Disease in Pregnancy.—Dr. William G. Dice, of Toledo, Ohio, stated that during pregnancy no cardiac murmur or irregularity was of itself an evidence of heart disease. Pregnancy lessened the life expectancy of any woman with a chronic valvular or muscular lesion. Valve lesions of themselves did not constitute a bar to pregnancy but the manner in which the heart did its work was all important. Every cardiopath was a cripple and her treatment throughout pregnancy and labor must be such as to spare the heart in every way. Cæsarean section gave the best results in uncompensated cases and in cases where heart failure threatened during labor.

Additions to Our Obstetrical Armamentarium.—Dr. Charles Edward Ziegler, of Pittsburgh, presented the following: 1. A new metallic nipple shield: This shield is made of pure aluminum, with numerous perforations for ventilation in both base and dome. The base is flared to conform with the convexity of the breast and is sufficiently roomy to protect the nipple from contact. It provides for the treatment of the abraded, fissured, inflamed, or sensitive nipple by affording absolute rest and protection against traumatism. 2. An umbilical cord clamp: This is composed of rubber and noncorrosive metal and has the form of a disc. It may be incorporated into the cord dressings without discomfort and left in place until the stump falls off. It minimizes the chances of infection, and greatly shortens the time of separation of the stump. 3. An identification wristlet for infants: In order to prevent mixing of babies various devices are in use, but none are entirely satisfactory.

Teaching Undergraduate Obstetrics.—Dr. Arthur M. Mendenhall, of Indianapolis, said that a greater effort should be made to impress upon the student that obstetrics was a major division of his medical course and that few, if any, primiparæ were ever delivered of full sized infants and left in as perfect condition as before. Then when the student went into obstetrical practice, he would carry this impression with him to the laity and do his part toward educating them to the importance of proper obstetrical care. More emphasis should be laid upon the proper handling of socalled normal cases and not so much of the student's time taken in trying to teach him the various kinds of Cæsarean sections and other obstetrical operations, which should only be performed by the thoroughly trained obstetrician. Socalled outdoor obstetrics at best was of little real value to the student and had better be abandoned entirely than continued without thorough and continuous supervision by the obstetrical teaching staff. Since diagnosis in obstetrics, as in all branches of medicine, was the real foundation for proper care and treatment, it was well that every possible opportunity should be utilized to teach this most thoroughly and the student's powers in this line were greatly enhanced by prolonged manikin practice, by large numbers of antepartum examinations, and by wide clinical experience. Teaching by interns, or those who had very little more knowledge, was sure to create a wrong impression of the importance of the subject and fell very far short directly and indirectly of the result desired. One of the most important ways in which one could at once obtain better results in teaching obstetrics was to impress upon the mind of the laity and hospital managers that a large and well equipped maternity hospital was the best place to teach obstetrics and at the same time would contribute strongly toward a reduction of fetal and maternal death rates in the community in which it was established, as well as in the communities where the students went to practice.

The Action of the Commoner Ecbolics in the First Stage of Labor.—Dr. M. Pierce Rucker, of Richmond, Va., said that the patient with a Voorhees bag in her cervix offered an excellent opportunity to observe the action upon the uterus of the drugs commonly used in obstetrics. From his rather limited observation it would seem that hyoscine had a moderate but rather constant ecbolic action in the first stage of labor. The action of quinine was more variable. Sometimes it markedly strengthened the normal rhythmic contractions, and sometimes it showed no action whatever. His observations upon the action of strychnine, castor oil, ergotol, and the fluid extract of ergot were too limited to warrant even a tentative conclusion. It would seem, however, that the possibility of an inert preparation of ergotol and the fluid extract of ergot was a real one. In the three cases in which pituitrin was used, even in minute doses, there was a continued contraction of the uterus that varied from nine to thirty-five minutes. This probably explained the disasters that had followed its use.

A Method of Delivery in Normal Cases.—Dr. Magnus A. Tate, of Cincinnati, Ohio, summarized the steps of the method as follows: 1. Patient must be in labor with an os dilated to at least the size of half a dollar, and an effacement of the cervical canal. 2. Surgical anesthesia. 3. Bladder catheterization. 4. Complete manual dilatation of vagina and cervix. 5. Patient allowed to regain partial consciousness. 6. Pituitrin, half a c.c.; repeat once if the pains are not efficient in half an hour. 7. Membranes ruptured. 8. Management of delivery as in usual cases.

An Analysis of the Potter Version.—Dr. Edward Speidel, of Louisville, said that having had the pleasure of a visit to Dr. Potter, in Buffalo, and from a limited experience with the method in private and hospital practice, he would like to discuss the version from three distinct points of excellence. 1. It was such a decided improvement over all the old established methods that it should supplant all other means of performing podalic version. 2. The delivery of the child after version had been performed was such a marked advance over the old methods of breech delivery that it should displace those practices at once. 3. His effective treatment of the child at birth by gentle rational manipulations was so superior to the many rough treatments that the asphyxiated baby had been subjected to heretofore, that it should surely induce every obstetrician to emulate them.

Treatment of Eclampsia: Then and Now.—Dr. J. F. Moran, of Washington, D. C., stated that the keynote of the treatment of eclampsia was individualization with attention directed particularly to morphinization, venesection, elimination, and facilitating delivery, all depending upon the state of the cervix and exigencies of the case. Radicalism was prompted largely by fear and expediency. Individualization and conservatism required courage and obstetrical judgment. Accouchément forcé was irrational, brutal and indefensible. Immediate delivery by Cæsarean section was rarely necessary unless indications of disproportion, rigid cervix, etc., obtained. Intermediate and conservative treatment yielded lower mortality and morbidity than was obtained by surgical and forcible intervention.

A Study of the Origin of Bleeding in Ectopic Pregnancy.—Dr. John Osborn Polak and Dr. Thurston S. Welton, of Brooklyn, said that from their studies they had shown that a decidual reaction might be found at several points in the tube in ectopic points often far remote from the seat of implantation. Coincident with the separation or death of the ovum by hemorrhage into the decidua, there was bleeding from the uterus and also bleeding from the several points of decidual reaction in the tube. Tubal peristalsis and the *vis a tergo* of the clot in the tube, expelled blood from the abdominal ostium into the peritoneum, which gravitated into the cul de sac. The same factors contributed a portion of the blood, making up the bloody discharge from the uterus, which signified the separation or death of the embryo.

Some Phases in the Evolution of the Diagnosis and Treatment of Cancer of the Cervix.—Dr. Roland E. Skeel, of Los Angeles, stated that any expectation of an increased number of cures of cancer of the cervix by surgical methods must be based upon earlier diagnosis. Panhysterectomy should be reserved for cases in which a positive diagnosis could be made with the microscope only. The parametrium being free, so far as digital examination could determine, but the case far enough advanced to be diagnosed clinically, a high cautery amputation of the cervix followed by radium treatment offered the greatest hope of cure. The advanced, surgically hopeless case should be treated by radium rather than with the knife, curette and cautery, chemical caustics or Percy cauterization, unless profound toxemia or serious infection contraindicated local interference of any kind.

Valuable Methods Used to Extend Operability in Advanced Cancer of the Cervix.—Dr. George van Amber Brown, of Detroit, said that the use of the starvation ligature mechanically accomplished instantly in the bloody supply what a study of a microscopic specimen of carcinoma showed nature was endeavoring to accomplish. The vessels should be tied at two points with either kangaroo tendon or heavy catgut ligature, as finer catgut might cut the vessel wall and precipitate a hemorrhage. Between the ties the arteries were crushed to a ribbon. Absorbable suture was used to avoid as far as possible the irritation factor that would undoubtedly arise from the use of the nonabsorbable material. In applying the heat the temperature was kept at 100°F. to 140°F., and the abdomen should always be opened so that the heating iron could be properly guided from the vagina through the cervix to the fundus. By so doing not only was the iron properly adjusted but the gloved hand of an assistant placed over the fundus was an aid in determining the amount of heat being used and the danger of injury to the bladder, rectum and ureter, with the formation of fistula avoided and sealing of the smaller bloodvessels and lymphatics accomplished. Should one not care to depend upon the heat and starvation ligature, and extirpation of the uterus was to follow, it should be done as a thermocauterectomy between the second and fourth week before the sickened cells had recuperated and before the deposit of scar tissue was sufficient to interfere seriously with operative procedures. With no other method could the fixed pelvic structures be loosened and mobilized as by the heat and ligature. Adequate x ray and radium treatments caused a decided radiation sickness from which the patient did not fully recover for from one to six weeks, rendering a hysterectomy hazardous. Hence in this respect the heat had advantages over the x ray or radium. After surgical procedures had been completed, x ray or radium or both might be employed to advantage, as was done in three of his cases; if hysterectomy was not to be done and the growth well within the cervix, radium alone was indicated; if involvement was broad, x ray combined with radium was used; if hysterectomy had been done, then later x ray was used, if doubt existed as to whether all cancer bearing tissues had been removed or if there was a recurrence. Postoperatively to pursue a set course without variations was hazardous. While x rays and radium were useful postoperative adjuvants they should never be used as preoperative measures.

The Control of the Mortality of Abdominal Operations for Cancer.—Dr. George W. Crile, of Cleveland, Ohio, stated that clinical and experimental investigations into the cause of the high mortality of abdominal operations for cancer had resulted in the formulation of plans of treatment whereby every case which was anatomically operable was given the maximum chance for survival. Every case was individualized. The type of operation and of postoperative care followed the anatomical and pathological indication, i. e., procedures followed indications, not rules. In resections of the stomach, intestines, or gallbladder the operation was performed in two stages, the second major stage being deferred until the nutritional balance was well established. Nitrous oxide oxygen analgesia was used in grave risks, anesthesia being secured mainly by local anesthesia. Fear and anxiety were controlled by management, and, when necessary, morphine. An ample incision, featheredge technic, minimum exposure of raw tissue to the air, prevention of loss of blood, conservation of body heat, all helped to secure the utmost protection of the patient. Blood transfusion was performed before, during, or after operation, and was repeated according to the state of the patient. A dietetic and hygienic regimen—forced feeding and fresh air in abundance—was established. By the use of these general measures and a technic adapted to the extent of involvement in the individual case, the mortality of resections of the stomach, the gallbladder, intestines, or of the colon for cancer had been progressively decreased and the range of operability extended; and the postoperative morbidity had been minimized.

Teratomata of the Ovary; Report of a Case.—Dr. Miles F. Porter, of Fort Wayne, Ind., said that no pure epiblastic tumors had been reported; therefore, the term teratoma was preferred to dermoid. There were two classes, solid and cystic. Their origin was not definitely known. Teratomata were frequently malignant, even the cystic variety showed malignancy often. Careful examination was necessary to determine the nature of a cyst of the ovary, hense the discrepancy as to frequency of teratomata. Teratomata occurred at any age, but was most frequent between the ages of thirty and forty. These tumors were more prone to torsion of the pedicle and to malignant change than other ovarian cysts, and less prone to rupture. Teratomata were peculiarly offensive to the uterus, causing abortion and infection. He reported the case of a primipara with a dead baby. Normal delivery took place a few days past term. The tumor was first discovered after delivery and removed five days after labor. Her recovery was complicated by paratyphoid infection. The tumor contained nine quarts of fluid.

New Trend in Gynecological Therapy.—Dr. George Gellhorn, of St. Louis, Mo., stated that just at the time when the general surgeons were claiming gynecology for their own, there was a marked tendency in gynecology to resort to nonoperative methods. The results accomplished with radium and x rays in the treatment of cancer and certain forms of fibroids in the uterus surpassed the achievements of the strictly surgical era. In other gynecological affections, notably those of inflammatory origin, persistent efforts were being made to supplant surgical methods by nonoperative ones. While results were not yet conclusive, they held out promise for the future. Certain diseases of the external genitals which heretofore had been entirely within the domain of gynecological survey, were cured more readily by nonsurgical means. Preventive obstetrics and its effect upon the surgical aspect of gynecology was discussed.

Atresia and Stricture of the Vagina.—Dr. James E. King, of Buffalo, N. Y., said that in the cases of atresia resulting from infantile vaginal infections, it was often impossible to obtain a history of the vaginal discharge, and it might thus be difficult to establish the real cause of an atresia discovered in adult life. Undoubtedly by far the most common cause of an atresia developing during childhood was infantile vaginitis. The atresia due to stricture seemed to present greater difficulties than the atresia due to vaginal adhesions. As a rule, the scar of these strictures was deep and its base broad. Before proceeding with the operation itself the strictures should be thoroughly stretched with dilators and finger, until sufficient dilatation was obtained to permit one to determine the limits of the scar.

Gynecological Observations Under Local Anesthesia.—Dr. Robert Emmet Farr, of Minneapolis, Minn., stated that the most ideal condition which had presented itself to him for the performance of surgical operations had been brought about by the preliminary use of morphine, combined with magnesium sulphate, and the establishment of perfect local anesthesia. By this means psychic incompatibility was practically eliminated, although in a large percentage of cases the psychic element had seemed to him to be of minor importance. Mixed anesthesia had many points of advantage. His feeling was that local anesthesia alone, or combined with gas, or with the judicial use of morphine and magnesium sulphate, offered special advantages over other forms of anesthesia now in use.

Suppurating Uterine Myomata.—Dr. William Edgar Darnall, of Atlantic City, New Jersey, read this paper, which appears on page 17 of this issue.

Ureteral Obstruction.—Dr. K. I. Sanes, of Pittsburgh, called attention to the frequent failures to diagnose ureteral obstruction, giving as reasons the anatomical relationships of the ureter and the great variety of obstructive factors. Good histories and careful physical examinations could be relied upon to give the indications for investigation of the urinary tract. If the studies he had suggested were conducted in doubtful urological cases, many a patient could be saved the trouble of unnecessary treatment or operative procedures, and could have their pathology corrected before it became irreparable. The unfortunate results of the neglect of such investigations were seen in almost every clinic. Attention of the profession, especially the surgical, should be called to it. Such investigations required a great deal of effort and were time consuming, expensive and required a close cooperation of well organized cystoscopic, pathological, and röntgenological departments. These arguments should not be used against diagnostic methods of procedure that were intended to save many lives and much unnecessary suffering.

Neoplasia of the Kidney—With Reports of Five Primary Cases: 1. Papillary epithelioma; 2. Hypernephroma; 3. Malignant teratoma; 4. Squamous celled carcinoma; 5. Lymphoblastoma. Dr. James E. Davis, of Detroit, reported five cases of primary renal tumor. He stated that the developmental history of the renal tissues was yet incomplete and at many points theoretical. The histogenesis for tumor tissue of the kidney was intricately involved by existing obscurities in both ontogenetic and phylogenetic development. The frequency of renal neoplasia occurrence was again emphasized as selective of young and old age periods of life. The diagnostic symptomatology was frequently exceedingly indefinite. Clinical and pathological investigation of renal tumors should be carefully made and reported in the literature.

Oxygen in the Peritoneal Cavity.—Commander William Seaman Bainbridge, of New York, said that oxygen mechanically held the scarified surfaces apart until new cells were formed. It increased the activity of the individual cells, thus hastening a new growth of epithelium to replace the destroyed peritoneal cells, the denuded areas being thus covered over. The increased peristalsis caused by the oxygen was unfavorable to the production of adhesions. From experiments which had been made one might deduct the following: 1. Oxygen was completely absorbed in the abdominal cavity. 2. It was a slight respiratory stimulant. 3. It was a slight cardiac stimulant. 4. It had but little effect upon blood pressure when the pressure of the gas was moderate. 5. It tended to bring an animal quickly from deep anesthesia. 6. It hastened the recovery of an animal after discontinuance of the anesthesia. 7. A pressure of more than 1,500 mm. of water might cause collapse. 8. Oxygen tended to prevent the formation of adhesions. 9. It quickly changed a dark blood to scarlet in cases of anoxemia. 10. It stimulated the intestinal peristalsis. 11. It was not an irritant to the peritoneum or the abdominal viscera.

A Plea for Routine Examination Upon the Operating Table as a Preliminary to Abdominal Operations.—Dr. John W. Keefe, of Providence, R. I., emphasized the following points: 1. The value of routine examinations under anesthesia upon the operating table preliminary to abdominal operations. 2. The necessity of a period to be spent in the general practice of medicine previous to becoming a specialist. 3. The importance of considering the human body as a moving equilibrium, in brief, as a living unitary organism. 4. The desirability of the masters in medicine becoming peripatetic and lecturing as exchange professors in the various universities. 5. Above all, the importance of remembering that careful work demanded time and personal attention to those multifarious details which modern medicine required.

Transperitoneal Nephropexy.—Dr. Thomas B. Noble, of Indianapolis, Ind., said that he felt warranted in recommending this operation because it established regional and general abdominal diagnosis. Through its primary incision much additional work could be done on other abdominal viscera, if necessary. It permitted the operator to put the kidney where it should be put and the lapse of time since its inauguration had been sufficient to prove the virtue of its characters.

Coincident Ruptured Ectopic Gestation and Acute Suppurative Appendicitis.—Dr. Charles E. Ruth, of Des Moines, Iowa, stated that twenty years ago suppurating appendicitis with diffuse peritonitis resulted in a mortality of not far from ninety per cent. Now ten per cent. was not expected, other complicating factors, such as he had in the case he reported, being absent. The principal factors in reducing the former great mortality were, he thought, five, as follows: Shorter time of operation; continuous proctoclysis to supply the needed body fluid while the stomach was irritable; Fowler position to aid drainage and prevent infection from gaining contact with the open mouthed lymphatics of the upper abdomen; less trauma from atmospheric exposure, manual manipulation and contact of peritoneal surfaces with dry gauze, and well placed, large drains.

The Indications for and the Dangers in the Use of Spinal Anesthesia in Obstetrics, Gynecology and Abdominal Surgery.—Dr. R. R. Huggins, of Pittsburgh, said that the freedom from nausea, abdominal distention, postoperative weakness and other disturbances so common with other forms of anesthesia recommended it as an improved method for cases when given under proper supervision and with full knowledge of its danger. He believed this method to be worthy of careful consideration on the part of every progressive surgeon who was willing to spend the time and care which were necessary in order to achieve success. Spinal anesthesia was the best anesthetic known today for certain operations in the lower abdomen. It should be given only after careful study of the patient. If it was not properly employed by one possessing sufficient skill, it might have a large mortality. There was no form of anesthesia which was altogether free from danger either immediate or remote. There were well defined contraindications to the use of all anesthetics in certain instances, and the operator must exercise judgment as to which should be employed in a given case.

Torsion of Appendices Epiploicæ.—Dr. Benjamin Rush McClellan, of Xenia, Ohio, stated that in twenty-four cases of appendices epiploicæ found twisted and incarcerated in hernial sacs, seventeen were in the left inguinal, five were in the right inguinal and two were in the left femoral.

Transuterine Insufflation, a Diagnostic Aid in Sterility.—Dr. A. J. Rongy, of New York, said that this procedure had been used in a sufficiently large number of cases by three or more investigators to warrant its universal adoption as a routine method in the diagnosis of and treatment of sterility. He hesitated to institute this examination fearing that untoward complications might take place and in that way, not only endanger the lives of the patients, but also give rise to legal complications. This procedure had been found in his hands to be safe, and he used it whenever he thought it was indicated.

Ten Years of Experience in Painless Childbirth.—Dr. George Clark Mosher, of Kansas City, Mo., stated that the hyoscine, morphine and cactin tablets were discouraging. The effect of morphine on the mother and fetus was unsatisfactory. He finally adopted pantopon after a trial of hyoscine and morphine, scopolamine and morphine. Sahli's mixture of alkaloids was not depressing. Crile's theory was not applicable to charity patients in city hospital service. An individual dose rather than a fixed amount for each patient was required. It was unsuitable in cases where less than two hours was expected before delivery. The advantages over cases in which delivery was made without amnesia were shown by a series of cases from records where scopolamine was used. There was less fatigue and shock, an absence of fear, less exhaustion, and a more rapid convalescence. Scopolamine amnesia, in his opinion, was the outstanding boon in labor in this decade.

Traumatic Inflammation of the Fundus of the Bladder.—Dr. Edgar A. Vander Veer, of Albany, New York, reported the case of a girl who fell and struck herself in the pelvic region. Six months later a tumor appeared over the injured organ. Operation was performed, which disclosed the fact that the tumor involved the fundus of the bladder and anterior abdominal wall. The inflammatory mass included the bladder wall. In the centre of it was found a small spicule of bone.

Abstracts from Current Literature

OBSTETRICS

Repeated Extrauterine Pregnancy on the Same Side.—W. Sigwart (*Zentralblatt für Gynäkologie,* May 6, 1922) reports such a case in a girl twenty-three years old, who was operated on for a rupture in the isthmus of the right tube. The tube was excised between the site of the rupture and the uterus but peritonealization was omitted because of her poor condition at the time. Four months later she was again seen in a severe stage of acute anemia. The cul de sac of Douglas felt doughy and abdominal aspiration revealed fluid blood. At operation the right tubal stump was found covered with a coil of intestine, underneath which was the fetus. There was no evidence of a tubal lumen or dilatation of the interstitial tubal canal and the ovum undoubtedly migrated there. The corpus luteum was in the right ovary. The site of the implanted ovum showed decidual changes and a few villous remains, proving the primary embedding of the ovary. The remarkable feature of this case was the rapid succession of the two ectopic pregnancies. The migration of the ovum was probably due to patency of the right uterine tubal canal so that the spermatozoa directly reached the ova from the right ovary. This was probably aided by the intestinal peristalsis. This case shows that when removing a tube for tubal pregnancy, the remaining tubal stump should be made impenetrable if the conditions allow. This is best accomplished by a wedge shaped excision from the uterus and a double seroserous suture of the wound bed.

That a repeated pregnancy may occur in a partially resected tube, even if the tubal end is securely closed, is shown by another case, in which the ectopic pregnancy took place in the isthmic portion of the tube. About seven years before a woman was operated on for a leftsided tubal abortion, the tube being excised at that time. There was a history of irregular menses and on examination a mass was found to the left of the uterus as large as a duck egg, doughy and movable with the uterus, which was believed to be of inflammatory nature. At operation a bluish red mass, corresponding to the tubal stump, egg shaped and as large as a plum with a smooth, markedly vascular surface, was found moderately fixed to the uterus. This was excised and was found to be a tubal mole. The tubal distal pole showed no macroscopically visible opening.

Carcinoma of the Uterus in Pregnancy, Labor and the Puerperium.—Egon Otmar Gross (*Zentralblatt für Gynäkologie,* April 15, 1922) found an incidence of 0.055 per cent. for carcinoma of the cervix in 224,080 labors and pregnancies. The pregnancy and carcinoma were positively simultaneous in twenty-four out of thirty-four cases seen one year postpartum. In twenty-six and seven tenths per cent., the carcinoma appeared following abortion or miscarriage, which it probably caused. In sixteen and seven tenths per cent. there were symptoms before the pregnancy, which was then interrupted. Most of the cases occurred between the age of thirty-one and thirty-five years; in the childbearing period most of the inoperable cases occurred between forty and forty-five years. The average number of previous pregnancies was six and three tenths. During pregnancy and the puerperium, the cancer grows more rapidly than usual and the metastases occur much sooner. The prognosis and the malignancy do not always run absolutely parallel: though permanent results and prognosis are particularly favorable in operable carcinomas radically operated upon during pregnancy and especially after pregnancy. Carcinoma of the vaginal portion was five times more frequent than that of the cervix; in nineteen and nine tenths per cent. both were affected. Youthful patients, especially during pregnancy, notice the carcinomatous symptoms earlier than is usual: in complicated cases the diagnosis was made accidentally during examination in seven and five tenths per cent. of cases. Birth traumatism produced symptoms of carcinoma after pregnancy: sixteen and seven tenths per cent. were treated during the puerperium and eighty-three and three tenths per cent. two or more months later. The diagnosis is usually easy but in early cases, biopsy gives certain proof. The operability of cases seen during pregnancy is strikingly favorable, but in cases seen postpartum, it is not so favorable because of the complications and metastases. The hyperemia of pregnancy allows an easier displacement and separation of the carcinoma. The primary mortality of operable cases was nil as compared to sixteen and ninety-eight hundredths per cent. in cervical carcinoma in general. In inoperable complicated cases treated postpartum, the prognosis was more unfavorable than generally. Energetic radiation never produced permanent cures, as contrasted with ten and three tenths per cent. results in general. The primary mortality was fifty per cent. in incomplete radical operations. Palliative treatment resulted fatally after an average of five months and eight and two tenths months after the first symptom of carcinoma was noticed. Only an early radical operation gives good results.

Operative Obstetrics.—J. O. Polak (*Surgery, Gynecology, and Obstetrics,* May, 1922) summarizes that surgical intervention is being too freely employed to terminate labor, and furthermore that the results for mother and child from such interference (oftentimes unindicated) with the physiological processes of labor do not justify their employment. That the adoption of the principle and practice of aseptic intelligent expectancy in labor, when the factors of labor are known to be normal or approximate the normal, is still the safest method of delivery not only for the mother but for the fetus. That there is a high morbidity even in the clean Cæsarean section, much higher in fact than is common in operations for pelvic tumors, such as fibromyomata and ovarian cysts. This is due to the presence of infective bacteria in the cavity of the puerperal uterus, which migrate from the vagina to the interior of the uterus, through the open cervix. That even in expert hands there is a definite maternal risk from Cæsarean section, greater than is generally known. Mortality studies show that this ranges from two and nine tenths per cent. to fourteen per cent., depending on the time in labor at which operation is done, after rupture of the membranes, and on the amount of vaginal invasion present. Finally, in view of these facts, the author believes that every pregnant woman should have greater prenatal study and care than is commonly given her, so that complicating conditions may be recognized, prevented, or corrected before labor, and where this is not possible, the knowledge gained from this study will permit the obstetrician to conduct the labor in such an intelligent and aseptic manner as to minimize the dangers from abdominal delivery.

Umbilical Cord.—J. P. Gardiner (*Surgery, Gynecology and Obstetrics,* February, 1922) in a study of the normal length, the length in cord complications, etiology and frequency of coiling, concludes as follows: 1. For the normal length of the umbilical cord we may accept the average length of fifty-five cm. (twenty-two inches). 2. Any cord under thirty-two cm. is an absolutely short cord and any cord over thirty-two cm. and under the average length is a relatively short cord. 3. In a vertex presentation, the placental insertion of the cord must not be farther than five cm. above the superior strait in order that the fetus may be born without traction on the umbilical cord, and the cord must be thirty-two cm. in length. 4. In a breech presentation, in order that the fetus may be born without traction on the umbilical cord, the cord must be fifty-five cm. in length. 5. In a vertex presentation with a loop of the cord about the neck, in order that the fetus may be born without traction of the umbilical cord, the cord must be 76.50 cm. in length. 6. In a vertex presentation with a coil of the cord about the neck, in order that the fetus may be born without traction on the umbilical cord, the cord must be 93.50 cm. in length. 7. In a breech presentation with a loop of the cord about the neck, the loop becomes a spiral and very little needs to be added to the length of the cord. 8. In a breech presentation with a coil of the cord about the neck, in order that the fetus may be born without traction on the umbilical cord, the cord must be 101.50 cm. in length. 9. The etiology of the coiling of the cord is not yet known but it is generally accepted that excessive liquor amnii, a long cord, a small sized fetus and the activity of the fetus are factors which make for coiling of the cord. 10. There is a coiled cord in every 5.5 births.

Individualized Treatment of Febrile Abortion.—E. Mauthner (*Wiener klinische Wochenschrift,* April 6, 1922) reports a series of 458 cases of febrile abortion in which the uterus was immediately emptied with a smooth recovery in eighty-nine and seven tenths per cent., with a protracted course in seven per cent. and with a mortality of three and three tenths per cent. Adnexal diseases are contraindications for immediate emptying of the uterus. Eight patients, admitted in very poor condition, recovered after anterior colpohysterotomy. In the fatal cases the patients were all admitted on the eleventh day of disease. Cases of bacterial intoxication are rarely dangerous but those of bacterial infection are dangerous; as these conditions are difficult to differentiate, there should be no delay in the treatment. Of thirteen patients, in whom the uterus was emptied in two or more sittings, five died and therefore this procedure is now abandoned. A systematic bacteriological examination is unnecessary and in every case of febrile abortion the uterus should be emptied at once, provided the infection has not advanced beyond the uterus. The treatment must be varied according to the nature of the case, depending upon the differences in consistency of the parametria, local inflammatory pain and subjective tenderness and anxiety, strands in the parametria, etc. The exact technic depends upon the condition of the cervix. 1. If the cervix admits a finger or is easily dilatable, the ovum is separated by the finger or forceps, avoiding rough handling; small residual masses of tissue are harmless; hemorrhage is due to uterine atony and should be treated with hot irrigations, with the upper part of the body raised, and with ergotin pituitrin injections, or if necessary, with loose packing of gauze which should be removed in twenty-four hours. 2. If the cervix is closed or only slightly open and rigid, the patient should be referred to a hospital; if the pregnancy is an early one, only an experienced physician should attempt the removal of the ovum with a forceps and the dull curette may be used exceptionally to empty the angle of the tube. If the cervix is impenetrable or if the pregnancy is advanced, emptying of the uterus with the forceps after an anterior colpohysterotomy is the operation of choice. If a hospital is not available, the spontaneous expulsion of the fetus may be hastened with quinine and the uterus may be emptied several days later. The use of the sharp curette should be abandoned in febrile abortion and the dull curette may be used exceptionally. Perforation of the uterus must be guarded against in every instrumental procedure in the uterus.

The Origin of Oral and Rectal Germs in the Newborn.—Rudolph Salomon (*Zentralblatt für Gynäkologie,* April 15, 1922) found that germs may appear in the rectum of the newborn immediately after birth and that the same organisms were present in the maternal vagina. During the first day gram positive cocci were seen and only a few gram positive bacilli, but later on this relationship was reversed. After twenty-four hours the roedella III were predominant; the colon bacillus appeared early; staphylococci occurred together with other bacteria only, but disappeared gradually with the growth of enterococci and the bifidus. The roedella III became gradually less prominent and after forty-eight hours the bifidus bacillus controlled the field; this organism is closely related to the Döderlein vaginal bacillus. The bath water cannot be blamed for the contamination of the mouth with germs. Forty-six per cent. of the mouths showed bacterial growth: first gram positive cocci, then gram positive bacilli, similar to the flora of the rectum and maternal vagina. The flora of the maternal breast skin also play an important part: a reciprocal relationship between the flora of the child's mouth and the maternal breast skin ensues. The taking of food and the change in the reaction of the oral fluid must also be considered: the mouth becomes acid with bacillary growth, whereas the original alkaline medium favors the cocci. Within twenty-four hours, nineteen cases showed twelve different organisms and within ten days there were twenty-one different organisms. During the first day the staphylococci were particularly prominent, then streptococci, gram positive diplococci, colon bacilli and the vaginal bacillus followed. In contrast to the rectum, the gram positive cocci were more numerous in the subsequent period than the gram positive and gram negative bacilli.

The sources of the oral and rectal germs include the maternal vagina, operative intervention, obstetrical procedures, as the extraction of the child and Cæsarean section, the puerperium, the maternal vagina and breast, the food and change of the oral reaction, the child's surroundings (air, clothing and attendants) and the rupture of the amniotic sac. The rectum shows a fair constancy of germs, but this is not so with the mouth. The virulence of the oral and rectal germs varies from day to day.

Experiences in the Prevention of Puerperal Fever.—F. Ahlfeld (*Zentralblatt für Gynäkologie,* April 15, 1922) reports a series of 8,753 labors, in which only one patient died (probably as a result of a selfexamination or of an existing internal disease). This he accomplished without the use of rubber gloves, without rectal examination, without the limitation of internal examinations, without the exclusion of preliminary vaginal irrigations and with the uninterrupted use of this material for teaching medical students and training midwives. These results are cited to show the incorrectness of Döderlein's teaching that the body is able to protect itself against infection. Because of the impossibility of preventing the introduction of infection by the woman herself and the surroundings, the author believes in the propriety of washing the external genitals and a full bath previous to delivery. Even in normal births intervention is necessary, and therefore the attendant must be trained how to prevent infection by the proper methods of examination and prophylactic measures.

Septic Abortion.—O. A. Cannon (*Canadian Medical Association,* March, 1922) suggests the following treatment: The patient is put to bed in the Fowler position, seated upon a sling pillow. She is better in a hospital, where she can receive skilled care and be shielded from visitors and annoyances. She should be put on a two hour pulse temperature chart. Water and nourishing fluid diet should be given in abundance. The bowels are opened by enemata and gentle laxatives. An ice bag is placed over the lower abdomen. If fluid is not taken freely by mouth, glucose or saline solution is given per rectum; or if not tolerated there, by subcutaneous injection. Appropriate stimulation is given if required. Ergot or pituitrin is used to keep the uterus in contraction. This probably blocks the lymphatic channels. Quinine is often used to remove retained products of conception. After the temperature has been normal for five full days and the uterus is not empty, the contents should be removed. The patient's return to health is thus expedited. Should hemorrhage have to be reckoned with during the course of septic abortion, the following procedure is recommended: With the patient prepared for operation, with plenty of assistants and if possible without anesthetic, pass the largest sized tubular cervical speculum that can be got in and through it pack weak iodoform gauze with blunt dressing forceps. Then about the cervix pack sterile cotton layer upon layer until the vagina is full. In twenty-four hours the packing is removed and with it is usually found the products of conception.

A New Method of Treating Puerperal Infection.—J. Hofbauer (*Zentralblatt für Gynäkologie,* April 15, 1922) recommends the subcutaneous injection of a two per cent. solution of nucleic acid combined with intravenous injections of hypophysis extract in cases of severe general symptoms (high pulse rate, temperature, etc.), with the body showing insufficient immunity reactions. Irreparable tissue changes are not affected by the treatment. Subcutaneous and especially intramuscular injections of nucleic acid are painful for a few hours. The resulting reaction is characterized by the production of fever, hyperleucocytosis and the stimulation to the production of ferment and antibodies, thereby increasing the patient's resistance; it also stimulates leucocytosis, which is an important factor in warding off puerperal infection. The reaction may be increased by subcutaneous salt injections. The therapeutic effect is further increased by the combination with intravenous injections of hypophysis extract. It produces an instantaneous and particularly intensive effect, stimulating the sites of immune body formation of the hematopoietic system and also producing a lasting contraction of the uterus. The nucleic acid promotes phagocytosis: a pure sodium salt of the nucleic acid should be used in the form of a two per cent. solution in physiological salt solution or in distilled water, mostly subcutaneously. A ten per cent. solution has been used intramuscularly.

The Birth Effect and Constitutional Element in the Genesis of Albuminuria in the Newborn.—Paul Lindig (*Zentralblatt für Gynäkologie*, May 6, 1922) states that the cause of the usual permeability of the kidneys to albuminous bodies of the blood plasma in the newborn and during the first few days of life is traceable to the effect of the birth on the fetus. It is comparable to the lordotic albuminuria and results from the overstretching and constriction of the ovoid fetus, which lead to congestive processes in the kidney with a resulting excretion of albumin. The albuminuria has been known to result from head injuries, marked muscular activity, sudden cooling of the body and particularly after the most varying external changes. In cases of Cæsarean section the excretion of albumin is the same as in normal births, as was also the case in fetuses that were not subjected to the contraction of the uterine muscle, showing that these factors are negligible as regard the etiology. The albuminuria of the newborn is a constitutional albuminuria, which may affect the predisposed organ during and after delivery as well as the newborn.

A Rare Case of Diphtheritic Infection in Newborn Twins.—E. Weber (*Zentralblatt für Gynäkologie*, April 22, 1922) reports the birth of twins in a twenty-five year old primipara. The mother manifested fever a few days later, which yielded to treatment. In both twins nasal snuffling developed after four to five days and both were injected with one thousand units of diphtheria antitoxin. The older child showed simultaneously a swelling and redness of the left labia majora, which gradually spread upward to the umbilicus without a rise of temperature; death followed with the signs of a general infection. On the sixth day postpartum, the second twin showed the same symptoms. The seropurulent discharge from the vulva of this child showed virulent diphtheria bacilli, long streptococci, the staphylococcus aureus and colon bacilli. Both the mother and this child recovered.

X Rays in Obstetrical Practice.—Edward W. H. Shenton (*Loncet*, April 29, 1922) asserts that pelvic deformities are easily detected with the use of x rays. In roentgenograms of the fetus in utero the quantity of the amniotic fluid and the paucity of mineral matter in the fetal bones may hamper the interpretation of the plate. Fairly good plates are obtainable at the fifth or sixth months of pregnancy. It is possible to determine: 1. the presence of a pregnancy or an abdominal tumor; 2. the position of the fetus; 3. the relations of the fetal head and pelvic canal, and 4. twins. The relative measurements of the fetal head and maternal pelvis are more valuable than the absolute measurements of either. The x rays in no way injure the baby. As to technic, the anteroposterior position for the head and pelvis with the latter tilted is suggested; for the abdomen, the lateral position with the woman on her side. Stereoscopy is useful if practicable. Intensifying screens and other aids to rapidity are essential.

Lutein Solution Hypodermically in the Nausea and Vomiting of Pregnancy.—Titian Coffey (*American Journal of Obstetrics and Gynecology*, May, 1922) reports sixty-two cases treated with a solution of corpus luteum, following the suggestions of J. C. Hirst. The total number of injections given was 410, making an average of about six and a half injections for each patient. Fifty-five cases, or 88.6 per cent., improved more or less rapidly; in only one case was failure absolute. The technic used consists in preparing the site of injection, using the deltoid preferably, with green soap followed by alcohol, with enough friction to redden the skin. The solution is injected deeply into the muscle and the patient, if ambulatory, directed to return home, remain quiet for twenty-four hours, and if there is any soreness, to apply a compress of equal parts of alcohol and water. Where the disorder is severe, the patient losing all meals and having constant nausea, the injections are given daily. Usually they are given every other day, using the deltoids alternately. Occasionally a patient complains of dizziness after the injection, and some state their nausea is increased in the first twenty-four hours, but by the second morning they are feeling greatly improved. Usually there is a rapid return of appetite after the second injection. Many patients state that they feel much less languid. No instance of anaphylaxis or alarming symptoms occurred among the author's patients.

A Case of Vagitus Uterinus.—H. Krause (*Zentralblatt für Gynäkologie*, April 22, 1922) reports a rare case of a fetal cry in the maternal body. During the process of an obstetrical version a protracted, fetal cry followed by a gurgling noise was heard, similar to the extrauterine cry of the newborn. The delivery was then hastened and on extraction of the child it cried at once but the respiratory passages were apparently not clear. Some bloody mucus was withdrawn with a tracheal catheter. The child died on the next day after expelling large amounts of bloody mucus from the mouth and nose. The necropsy showed partial atalectasis of the lung and petechial hemorrhages and emphysema underneath the pleura as signs of spasmodic inspiration. The uterine cry was probably made possible by the wide soft parts and the rapid expulsion of the amniotic fluid. All of the cases in the literature occurred only in accouchement forcé.

The Significance of Microscopic Capillary Findings in Eclampsia.—Hans Nevermann (*Zentralblatt für Gynäkologie*, April 22, 1922) comes to the following conclusions as a result of his microscopic capillary experiments: 1. The same capillary changes occur repeatedly in more or less pronounced form in eclampsia and its preliminary stages. 2. These changes occur in the same or a similar manner not only in eclampsia but also in other diseases. 3. Venesection improves the circulation in eclampsia. 4. The circulatory change depends upon other factors, such as spasms of the precapillaries and possibly of the postcapillary vessels and respiration. 5. The changes visible in the skin capillaries also appear in other capillaries of the human body.

Intrauterine Death.—A. B. Spalding (*Surgery, Gynocology and Obstetrics*, June, 1922) asserts that from a study of fetal skulls with the x ray in thirty-one cases of pregnancy, it has been found that with live babies the fetal skulls appear normal except for the effect of labor which produces an overlapping of the skull bones. In three cases of intrauterine death, the x ray picture showed the marked overlapping of the skull bones with distinct signs of shrinkage of the skull contents. From these facts the author believes it justifiable to state that shrinkage of the skull contents with overlapping of the skull bones can be demonstrated with the x ray, which gives a pathognomonic sign of intrauterine death.

Frontal Presentation.—Alfred Hermstein (*Zentralblatt für Gynäkologie*, April 29, 1922) reports a case in which version and the forceps failed to deliver the child and finally the cranioclast had to be used. The treatment depends upon the stage of labor. In the first place, attempts should be made to change the presentation into a more favorable one by changes in position and the various maneuvres, such as that of Baudelocque, Thorn, Schatz, Zangemeister, Hildebrand and Collins, all of which demand that the head be freely movable. If these fail, podalic version may be tried with simultaneous or subsequent extraction. If this is impossible the forceps may be tried, but cranial injuries must be looked for and if possible avoided. Undoubtedly the best procedure is a suprapubic extraperitoneal section, which offers a much more favorable outlook for both mother and child.

Protection of the Perineum in the Left Lateral Position.—K. Heil (*Zentralblatt für Gynäkologie*, April 29, 1922) asserts that with this maneuvre the expulsion of the fetus takes four to five minutes in primiparæ and that the children are born in excellent condition. It is very important that the woman in labor should assume the left lateral position only when the head is just coming through. To prevent precipitate deliveries the attendant should keep the left hand tightly pressed against the fetal head and retard it during the process of changing the position. The woman should be instructed to press down during the painless intervals and at the same time the head is coaxed down with the posterior perineal maneuvre. This position affords a better supervision of the parts.

Eclampsia and Its Incidence.—R. H. Paramore (*Lancet*, December 3, 1921) suggests that eclampsia is a variety of uremia due to physical disturbances which produce an aberration of the normal metabolism. His conception is based on the idea that intraabdominal pressure is a vital force related to metabolism. Clinical experience has shown that eclampsia occurs with greater frequency in cases where intraabdominal pressure is unduly elevated.

Uteroplacental Apoplexy in Accidental Hemorrhage.—P. Willson (*Surgery, Gynecology and Obstetrics*, January, 1922.)—The author presents a study of all cases in the literature of accidental hemorrhage, together with report of a case of his own. He bases his discussion on sixty-nine clinical and forty-six pathological case reports. He also considers the relation of uteroplacental to accidental hemorrhage and to other toxemias of pregnancy. In conclusion he discusses the diagnosis, prognosis and treatment of the affection. In a discussion of the many etiological theories advanced he shows that hypotheses based on mechanical production are untenable. On the contrary, both the negative and positive evidence point to the cause being in the nature of a toxemia. Fully ninety per cent. of the cases under review showed other evidence of a general toxemia. The author's observations have led him to conclude that uteroplacental apoplexy is caused by inundation of the uterine wall by a toxin. This appears to be similar in nature to the hemorrhagins found in snake venom. He holds that they are liberated from the placenta and, therefore, naturally produce their maximum effect at the site of their absorption and greatest concentration, i. e., in the wall of the uterus, where they cause thrombosis of veins and local passive congestion. Clinically the most significant fact is the damaged state of the uterine wall, for this is responsible for the intraabdominal as well as the postpartum hemorrhage. With regard to treatment, the author thinks it most conservative, with an undilated cervix, to perform an abdominal Cæsarean section, followed by hysterectomy, if this should appear necessary for ensuring certain hemostasis.

Clinical Study of the Placenta.—J. E. Talbot (*Surgery, Gynecology and Obstetrics*, June, 1921) states that placental infarcts are the result of hematogenous infection of the uterine bloodvessels, resulting in localized thrombosis, and as such, they are a clinical record of the presence of bacteria in the blood stream of the pregnant woman. The injury done to the placental site, when it occurs in the early months of pregnancy, may affect the shape of the placenta and thus account for certain of the complications of pregnancy. The obstetrical history of another case reported represents a clinical entity with chronic sepsis in the tonsils as the continuous etiological factor. Placental infarcts give more positive evidence than blood cultures of the presence of bacteria in the blood stream.

Hypnosis in Obstetrics and Gynecology.—R. Falk (*Zentralblatt für Gynäkologie*, April 29, 1922), asserts that hypnosis proved valuable in six out of seven cases of hyperemesis gravidarum. Every dysmenorrheic pain, including that due to stenosis, can be relieved by it: only three out of sixteen cases were refractory to it. Every case must be treated individually, according to the psyche of the patient. Twelve cases were permanently and completely cured with an average of ten hypnoses. Secretory, vasomotor and exudative processes can be influenced by hypnosis. The patient may become red, pale or caused to perspire: this is applicable especially in the treatment of menorrhagias. One case of sexual frigidity was cured by hypnosis. Harmful effects were never noted.

Influenza, Pregnancy and Emphysema.—J. D. T. Reckit (*Lancet*, April 29, 1922) reports a case in which a woman while convalescing from influenza, gave birth to a child in the breech presentation. Three days later the right eye, face, forehead, neck and chest became markedly swollen and urgent orthopnea resulted. On the following day the emphysema extended to both arms, the backs of the hands, the abdomen and back, with a peculiar crackling in these swollen areas. During the next few days the emphysema slowly receded. During the labor pains and the forced expiration air escaped into the posterior mediastinum and so into the neck and other parts.

Indications and Contraindications for Potter Version.—William J. Harman (*Journal of Medical Society of New Jersey*, May, 1922) gives the indications for Potter version as, 1, left occipitoposterior; 2, right occipitoposterior; 3, transverse; 4, arm presentations; 5, placenta prævia and eclampsia; 6, dead fetus. The contraindications are set down as, 1, normal delivery, every woman should have the test of labor; 2, undilated cervix; 3, contracted pelvis; 4, funnelshaped pelvis; 5, oversized child. No version should be performed without some idea of pelvic measurements, position and size of the child.

GYNECOLOGY

Bacteriology and Pathology of Fallopian Tubes.—A. H. Curtis (*Surgery, Gynecology and Obstetrics*, December, 1921) presents the following conclusions: 1. From the clinical history, examination of the external genitalia, and evidence obtained at operation, together with a laboratory study of the tubes in this series of nearly three hundred patients, it has been possible to determine that gonococcal infection was responsible for the pathological changes in over seventy per cent. of the cases. Approximately ten per cent. more were thought to have been primarily infected with the gonococcus, but this could not be determined with certainty.

2. In somewhat more than fifteen per cent. of these patients the tubal pathology appears to have been entirely due to other pus producing bacteria, notably various types of streptococci.

3. Tuberculous tubes, in the absence of generalized tuberculous peritonitis, were encountered in five per cent. of the cases.

4. Bacillus coli is particularly frequent in tuboovarian abscesses of large size. As a primary cause of salpingitis neither the colon bacillus nor the staphylococcus appears to be of notable importance.

5. It has almost never been possible to obtain gonococci in cultures from thoroughly ground fallopian tubes removed from patients who have been free from fever and leucocytosis for a period of more than ten days or two weeks. The fallopian tube appears, therefore, not to be a focus for chronic gonorrheal infection. Persistently active gonorrhea of the tubes is evidently ascribable either to recurrence of infection from without or repeated invasion of bacteria from the chronically infected genital tract.

6. Tubal infections with various types of streptococci yielded pathological evidence of an active inflammatory process long subsequent to the introduction of infection, and streptococci were occasionally isolated many months, or even years, after the acute process had subsided.

7. Gonorrheal pelvic infection primarily involves the tubes, with resultant thickening, induration, closure of the fimbriated ends, and pelvic adhesions which are amenable to separation by blunt dissection. Microscopically, the folds of the mucosa are found adherent, pockets of gland like columnar epithelium extend deeply into the wall of the tube, blood vessels are numerous, and plasma cells are characteristic.

8. If the patient can be early isolated from the source of her infection, a single attack of gonorrheal salpingitis is usually borne without protracted clinical symptoms or severe pathological results. Greatly thickened tubes are most often associated with repeated exposures.

9. Implicit reliance should not be placed upon hematosalpinx as dependable evidence of tubal gestation. Hemorrhage may occur in greatly thickened gonorrheal tubes.

10. Salpingitis nodosa, although most frequently of gonorrhœal origin, may be due to one of many causes, either inflammatory or noninflammatory; the microscope best explains the etiology of any doubtful case.

11. In streptococcus infection tubal involvement is usually but a part of the picture. Perisalpingitis is the most frequent type of tubal lesion. Even though there is an extensive salpingitis, the fimbriated extremities will very likely remain open; the mucous membrane folds, or villi, of such tubes show few adhesions. On the other hand, with the less common occurrence of occluded fimbriæ and accumulated fluid within the tube, adhesions are present between the villi and there are nests of columnar cells in the tube walls; differentiation from the gonorrheal tube is then difficult.

12. Tuberculosis is likely to be overlooked if routine histological preparations are not made. When limited to the pelvic organs it is difficult to establish a diagnosis from the gross appearance alone. Unusually resistant adhesions suggest tuberculous or streptococcus infection.

13. Somewhat similar operative measures appear indicated in streptococcus and in tuberculous salpingitis. In both diseases infection is not usually confined to the tubes; in both, viable bacteria are often still present in the tissues at the time of operation and there is danger of chronic postoperative infection of the ovaries. Particularly in regard to extirpation of the ovaries, more radical surgery appears indicated than in gonorrheal infections of corresponding severity.

14. The results of this work again direct attention to the dangers of uterine instrumentation. Nearly all streptococcus infections in this series were traceable to instrumental abortion or subsequent intrauterine manipulation; some tubal infections recurred after curettage; tent dilatation was followed by streptococcic pelvic abscess. It would appear that the normal uterus and fallopian tubes are comparable with an unopened tube of culture media; passage of instruments through the bacterial barrier of the internal os is analogous to removal of the cotton plug, and nature is not always able successfully to combat infection before serious lesions have resulted. This is particularly true if infection which has been previously introduced is stirred up through subsequent instrumentation.

A New Surgical Procedure for the Treatment of Extensive Uterine Prolapse.—Duschan Maluschew (*Zentralblatt für Gynäkologie,* April 29, 1922) proposes the following technic: The vaginal portion of the cervix is circumcised and the vaginal wall is bluntly reflected at the most two cm. A posterior colpoceliotomy is then done, carrying the incision to the perineum. The posterior surface of the uterus is then brought forward and the round ligaments are drawn down through the broad ligaments with Kocher clamps and grasped far from the uterine cornua by assistants. The upper end of the celiotomy wound is sutured a short distance so as to prevent the cervix from slipping into the wound. The uterus is then sunk by slowly drawing the Kocher clamps forward: the round ligaments approach the side of the portio, are then united with a few sutures to each other, fastened to its anterior surface and covered by the vaginal flap. The celiotomy wound is closed in such a manner that the sacrouterine ligaments and the two legs of the levator muscles are included by taking a big bite with a large curved needle. If necessary, a perineal plastic and an anterior colporrhaphy may be added. If urinary incontinence persists, a later pyramidalis fascia plastic operation (Goebell-Stoecker) may be done. The greatest advantages of this operation are the anteversion of the uterus and a pronounced lifting of the portio, and a marked flattening of the deep cul de sac of Douglas resulting from the suturing of the sacrouterine ligaments and the levators; sterility does not necessarily follow.

Hysterectomy.—Clark and Norris (*Surgery, Gynecology and Obstetrics,* April, 1922) from an analysis of the end results in 232 hysterectomies, present the following conclusions:

1. Hysteromyomectomy is productive of excellent end results whether or not ovarian conservation is practised. Of all patients in our series, over ninety-nine and five-tenths per cent. were cured or improved, and over eighty-three per cent. declared that their general health was good or improved one year or more after operation.
2. Better end results and greater comfort to the patient can be secured as the result of ovarian conservation.
3. Everything being equal, better end results follow the conservation of both ovaries than the retention of one, but one ovary is far better than none.
4. Conserved ovaries seldom give subsequent trouble. Among 171 cases in which ovarian conservation was practised, 261 ovaries were conserved, and in none of these patients was a second operation for the removal of the ovary necessary. This is a strong argument in favor of ovarian conservation in this class of cases, for if the conserved ovary does not give trouble, there can be no excuse for its removal.
5. That conserved ovaries may give subsequent trouble is conceded, as is also the fact that the series of cases quoted may have been unusually fortunate in this respect. Successful ovarian conservation depends upon the condition of the ovary at the time of operation, the maintenance of an adequate blood supply, and the retention of the ovary in its normal position.
6. Undue emphasis has been placed upon the frequency of cystic and other forms of degeneration in conserved ovaries, and that attention to the points just mentioned will largely abrogate such disturbances.
7. Bearing in mind the fact that good results can be secured by performing bilateral oophorectomy, it is often better to sacrifice a doubtful ovary than to spare it. This is a point, however, on which each case must be judged individually.
8. When both ovaries are removed, the surgical menopause is by no means severe in all cases, those patients who suffer unduly being in the minority.
9. The age of the patient is not an unfailing criterion as to the severity of the surgical menopause in any given case. Young women will sometimes bear the loss of both ovaries well, whereas some of the most severe phenomena of the surgical menopause encountered in this series have occurred in patients past forty years of age. This does not imply that the age is an unimportant factor in considering the question of ovarian conservation. Other things being equal, there is no doubt that younger women suffer more severely as a result of a bilateral oophorectomy than do those who are older.
10. A more important guide than the age, however, is the temperament of the individual patient. The highly strung, neurotic woman is likely to suffer more severely than her more phlegmatic, asexual sister.
11. Each case should be individualized. The temperament of the patient should be studied, and a correlation of this with history and the pathological process found at operation should determine the type of operation.
12. Conserved ovaries functionate.
13. Even in those patients in whom the ovary does not functionate permanently, the occurrence of the surgical menopause is less abrupt and severe than in those women upon whom a bilateral oophorectomy has been performed. Among the former class of cases the artificial menopause generally resembles the normal menopause more closely than does that following the removal of both ovaries.

Tumors of the Cervix and Uterus.—L. R. Wharton (*Surgery, Gynecology and Obstetrics,* September, 1921) discusses rare tumors of the cervix and uterus as follows: Condyloma of the cervix is one of the rarest of gynecological disorders. Etiologically, pathologically, and clinically, there are two distinct types of condyloma of the cervix, the gonorrheal and the tuberculous. When complications are not present, the symptomatology in these two types may be identical, the chief complaint being the presence of a profuse, purulent, vaginal discharge which may be occasionally tinged with blood. Both from the viewpoint of the history and the clinical findings, there may be no small resemblance between condyloma and malignant tumors of the cervix. Gonorrheal condylomata may occur singly as isolated pedunculated tumors or in clusters of papillomata which may almost entirely cover the cervix. These masses may present varying grades of inflammatory reaction. Gonorrheal condyloma of the cervix may be accompanied by similar lesions on the vulva and perineum and also by salpingitis and its many manifestations, but in our experience the endometrium is not usually affected. The primary focus of infection appears to be in the cervical glands. In the treatment of gonorrheal condyloma, it is necessary to clean up the focus of infection and also to remove the local growth. Curettage of the uterus is unnecessary and should not be performed. Tuberculous condyloma of the cervix is almost always accompanied by other manifestations of the disease. There is almost always a concurrent tuberculous endometritis and salpingitis, and very frequently other lesions may be found. For this reason the operative treatment of the cervical lesion should be undertaken only after a careful study has been made and on the basis of sound surgical indication. In gonorrheal condyloma the outlook is uniformly good; in tuberculous the prognosis depends entirely upon the nature of the concomitant lesions and the method of treatment instituted.

Investigations on the Genital Nerve Corpuscles in the Clitoris and the Labia Minora.—Fr. Chr. Geller (*Zentralblatt für Gynäkologie,* April 22, 1922) found that the nerve ends in the clitoris and labia minora are of two groups: the free nerve endings and the nerve end corpuscles. The smallest free nerve endings course closely beneath the epithelium, whereas the genital corpuscles are never found in this region but exclusively beneath the papillary layer. The Bielschowsky method of staining shows the typical genital nerve corpuscles as spiral or coil shaped strands of one or more nerve fibre, bandshaped and well circumscribed by lamellous connective tissue fibre. They are usually intimately connected with or surrounded by a fine capillary. The author assumes that these structures are sensory end organs whose undisturbed function is necessary for an occurrence of the orgasm.

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NEW YORK, WEDNESDAY, JULY 5, 1922

Letters to the Editors.

ANAPHYLAXIS AND EPILEPSY

Boston, Mass., *May 24, 1922.*

To the Editors:

Dr. Ward's interesting paper on Protein Sensitization as a Possible Cause of Epilepsy and Cancer, in a recent number of the Journal, furnished the stimulus for this letter, which I trust you will do me the favor to publish.

Anaphylaxis is regarded by investigators as due to autonomic irritation. It will be remembered that the vegetative nervous system is composed of two branches, the autonomic and the sympathetic. Epilepsy has been shown to be a disease in which the sympathetic fibres are profoundly diseased, beginning with a hypertonicity and ending in their degeneration. The other branch of the vegetative system, the autonomic, is sometimes diseased in epilepsy (as shown by the eminent New York epileptologist, Echeverria, who found vagal degeneration). It is interesting to note that anaphylaxis at times is prevented by atropine, an autonomic paralysant, and to note likewise that belladonna has been found effective in some cases of epilepsy, perhaps in the rare cases in which anaphylaxis may play a part, and in which vagal (autonomic) fibres are diseased.

There is no question that fright produces convulsions and epilepsy (most frequently in the predisposed) and this without the introduction of a foreign protein; so that anaphylaxis can be ruled out in those cases. Furthermore, fright acts through the sympathetic branch of the vegetative nervous system—while anaphylaxis depends on autonomic irritation.

To explain the phenomena of convulsions in epilepsy, we need no aid from anaphylaxis. It is known that acute anemia as is produced by vasoconstriction of the bloodvessels in the brain, results in convulsions. The diseased sympathetic fibres in epileptics that can be made, by reflex action, to produce an intense visible vasoconstriction in the skin of the patient, indicates that a similar intense vasoconstriction can take place in the epileptic's brain with a resulting anemia and outbreak of convulsions. A French surgeon, during an operation on the skull, witnessed this intense vasoconstriction in the brain and convulsions in an epileptic.

Incipient epilepsy, designated by Echeverria as the stage of the disease in which the epileptic attacks are solely manifested by sudden pallor, loss of consciousness, and vertigo, has been found to be associated with a demonstrable hypertonia of sympathetic fibres. This hypertonia yields to drug treatment (the use of colloidal œnanthe—a sympathetic paralysant), and both signs and symptoms of the disease disappear. A paper embodying some of the research work resulting in these findings, was read at the Boston meeting of the A. M. A. last June, and published in the *Medical Record* for March 11th last. With the facts embodied in that paper before us, it would be a serious thing to neglect their lesson, and negligently allow cases of incipient epilepsy, easily diagnosed and treated, to progress into chronic epilepsy, that *bête noir* of scientific treatment.

Edward A. Tracy.

SOLUBLE DERIVATIVES OF CHAULMOOGRA OIL IN TUBERCULOSIS.

London, *June 8, 1922.*

To the Editors:

From the references in Dr. Beasley's paper on the Treatment of Tuberculosis with derivatives of Chaulmoogra Oil in your issue of September 21, 1921 (which has only recently come to my notice), to the work of Dr. McDonald (*Journal American Medical Association*, November, 1920) your readers might incorrectly infer that the febrile and local reactions produced in leprosy by injections of such compounds, and the all important breaking up of the lepra bacilli in the human tissues accompanying them, had been discovered by Dr. McDonald; so they may be interested to learn that these phenomena were first described in my paper in the *British Medical Journal*, October 21, 1916, and were illustrated by colored plates in the *Indian Journal of Medical Research*, October, 1917. Moreover, in the earlier paper referred to, I suggested the use of such preparations of chaulmoogra oil "in the case of the other human acid fast bacillus, namely that of tuberculous disease," promising trials of which in phthisis will shortly appear in the *British Journal of Tuberculosis*, while I have also shown the value of sodium morrhuate, made in a similar way from codliver oil, in tuberculous disease. (*British Medical Journal*, February 8, 1919, and *Indian Journal of Medical Research*, 1919, p. 236.) The papers of such research workers as Professor Dean and Walker and Sweeney (to the latter of which Dr. Beasley refers) have, of course, acknowledged my earlier work, a convenient summary of which with its bearing on the tuberculosis problem appeared in *The Practitioner* of August, 1921.

Leonard Rogers, Lt. Colonel, I. M. S., Ret.

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A Physiological Adjuvant in the Rest Cure of Pulmonary Tuberculosis*

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(Approved for publication by the Surgeon General of the U. S. Public Health Service.)

Many attempts have been made by numerous experimenters to add local rest for the tuberculous lung to the general bodily rest treatment. Denison (1) and Sewall (2) suggest mechanical restrictions by means of adhesive plaster or belt; Bridge (3) by will power, and Webb (4) by posture. All report good results, but none that can be compared with the results obtained by a successful artificial pneumothorax where the involved lung is completely collapsed and, so to speak, put out of commission. Of the results of artificial pneumothorax in the various stages of the disease so much has been written that it would be superfluous to try to give any statistics here. We all know there is a vast difference of opinion concerning the utility of artificial pneumothorax, particularly in the early cases, and we all know that, owing to pleuritic adhesions, the number of advanced cases of pulmonary tuberculosis suitable for that operation have up to now been limited.

The operations devised by Jacobæus (5) who, with the aid of the thoracoscope and a long cautery protected by a cannula, divides the pleuritic adhesions, may help to diminish the number of cases which have heretofore been considered unsuitable for artificial pneumothorax. Thoracoplastic operations may perhaps also more frequently be resorted to hereafter for the same purpose as the operation becomes more perfected, but these procedures must be considered more or less dangerous. In dividing the pleuritic bands with the bistoury or even with the electric cautery, there will always be some danger of coming across very vascular adhesions, or such extensive ones that there may be danger of hemorrhage and rupturing the lung. The thoracopneumoplastic operation has thus far yielded a rather high mortality even at the hands of so skilful a surgeon as Archibald (6) so that it must be restricted to a few cases.

All the procedures just described, however, seem to have one sole object in view, namely, to limit or to restrict entirely the respiratory movement of the invaded lung. Comparative physiology (7) teaches us that the slow breathing animals live longer and are less susceptible to tuberculosis than the fast breathing ones. As an example, we will cite the horse with only eight to ten respirations a minute, in contrast to the cow which breathes fifteen to thirty times a minute. The animal which perhaps lives longest is the turtle, whose respirations are so few a minute that they are hardly perceptible. Its resistance to human tuberculosis inspired Friedmann to make his serum, which unfortunately up to now has not proved what the inventor claimed for it.

Now if the slowly breathing animal is least susceptible to the invasion of tuberculosis, and a lung invaded by tuberculosis is benefited by restriction of its respiratory movements through outside pressure or the complete arrest of function by means of an air splint (artificial pneumothorax) or bone compression, why should not restricted respiratory movements and reduction in their number by voluntary effort be equally valuable as an adjuvant in the cure of pulmonary tuberculosis?

I made the first experiments on myself and have been able to reduce my respirations, without discomfort, to eight, six, and sometimes to five a minute, restricting respiratory movements to the diaphragm. I recommended this to a few of my patients in the various stages of the disease and was astonished to find how well they could train themselves to reduce their respirations from twenty-four to thirty a minute to ten, eight and six, and gradually do this for half an hour or an hour at a time, and do it several times a day.

As far as I have gone, the patients have not experienced any discomfort from these exercises but felt better, their general condition had improved, and the physical examination showed less activity locally.

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*Read before the tuberculosis staff of the U. S. Veterans' Hospital No. 61, Fox Hills, N. Y., March 16, 1922; and before the Clinical Section of the National Tuberculosis Association at its meeting in Washington, May 4, 1922.

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One patient confessed to me that after following my suggestions for some length of time, he experienced an intense desire to take a deep breath. Having been instructed not to do so, he imagined himself to feel very uncomfortable. I told him that the next time he felt like taking a deep inspiration, he should not hesitate to follow his inclination. A few days later he assured me that the thought that he could take a deep breath when he wanted to made him feel much more comfortable and that he could keep up his restricted breathing for a longer time.

Although clinical experience has shown that patients can live and breathe when there is only about one fourth of lung area in condition to attend to the oxygenation necessary for life, I did not feel certain of the wisdom of my procedure as a therapeutic means. I feared that perhaps I might in the long run do harm to my patients by allowing an accumulation of carbon dioxide and a privation of the life giving oxygen. According to Weber (8) and his followers, it would seem that a moderate accumulation of carbon dioxide is not by any means to be feared but rather to be favored in pulmonary tuberculosis; nevertheless, to be on the safe side, I consulted with Dr. Graham Lusk, professor of physiology at Cornell University Medical College, and demonstrated for him this method of breathing. He was astonished at my being able to reduce my respirations to four a minute. He told me that in his opinion no possible harm could be done to the patient by using superficial respiration or restricting the number of respirations a minute. Wishing to have something authentic for publication on the subject, I asked him to write me his opinion with permission to use it, which he most kindly did as follows:

"Under ordinary conditions the production of carbon dioxide in the tissues controls the volume of the respiration. If the number of respirations a minute be decreased, the volume of air expired and inspired in each breath is automatically increased. The total gaseous exchange, however, remains approximately the same. Under ordinary conditions of rest the quantity of oxygen absorbed is almost the same whether there be seven or fifteen respirations a minute."

I have not only been able to verify Professor Lusk's statement by interesting experiments, but to my surprise I found that the volume of air inspired and expired when the respiration was limited to the basal portions of the lungs, that is to say, the volume of tidal air, was even materially increased over the normal. Through the courtesy of Professor Lusk and with the valuable cooperation of Dr. D. P. Barr, of the Russell Sage Institute of Pathology, I was permitted to make some spirometric tests during the respirations restricted in number and limited to the diaphragmatic mode of breathing. Dr. Barr kindly lent himself to the experiment. After I had demonstrated to him how he could diminish the number of respirations to five a minute and limit them to the basal portion of the lungs, he was surprised to find with what comfort he could do it and thought he could do it indefinitely. Dr. Barr has an unusually well developed chest, and in ordinary respiration his tidal volume is 600 c. c. to the respiration. We both observed with interest that the volume of tidal air increased considerably while he was lying in a recumbent position, breathing through the tube of the spirometer. We repeated the experiment twice, each time lasting for three minutes, and the average number of inspirations and expirations did not exceed five a minute. Dr. Barr assured me that throughout the three periods of experimentation his respiration was comfortable and adequate, yet the upper portion of his lungs was virtually at rest.

It is of course possible that, when one limits his respiratory function voluntarily, there is an unconscious effort to take in more air than is actually needed. But this experiment proves that no harm can possibly be done by restricted respiration, and that a more thorough ventilation of the usually nonaffected basal parts of the lungs in tuberculosis individuals can only be beneficial.

Besides the chemical stimulus to the continuance of respiration, there exists also a nervous stimulus to which McLeod (9) refers in his article on Some Recent Work on the Control of the Respiratory Centres. He says: "There are in general two ways in which the activities of the centre might be caused to alter. These are by changes in the chemical composition of the blood supplying it and by nerve impulses derived from other parts of the nervous system." In other words, the respiratory movements can, in no small degree, be controlled by the will. In recruiting for the aviation service in France, it was found that those who could retain their breath from fifty to sixty-five seconds were best fitted to be aviators (10).

The reason for the improvement in those of my patients who faithfully carried out my instructions concerning restricted breathing, I believe to be the relative rest which was given to the lung by this process. If one succeeds in reducing his respiration from twenty a minute to ten, he has spared his lung three thousand movements in five hours. Even if it seems difficult for the patient to do this for any appreciable time, he will derive considerable benefit from limiting his respiration to the basal portion of the lung. This part of the procedure, intended to obtain local rest for the upper portion of the pulmonary area, is easier to carry out than the voluntary reduction of the number of respirations a minute.

Of course, when one palpates the anterior portion of the chest over the upper lobes, one may perceive a slight movement, particularly in beginners, but this diminishes as the patient becomes more habituated to diaphragmatic breathing.

The difficulty of obtaining sufficient rest by external restriction of the thorax inspired Webb and his coworkers, Forster and Houk (4), to investigate the value of simple posture in the treatment of pulmonary tuberculosis. These observers found that patients who slept or rested during the day on the side of their diseased lung, did a great deal better than those who slept on the opposite or well side. To add this treatment by posture, particularly during sleep, to the respiratory method described in this paper, can only be of additional advantage.

In this communication I shall avoid all statistics and only refer to the results obtained in a few cases in the advanced stages with cavitation in my service at Fox Hills and in private practice. The patients had the usual symptoms of toxin absorption. After practising the method of restricted breathing for a couple of weeks, cough, expectoration, and temperature had gradually but perceptibly diminished and auscultation revealed a decided tendency to fibrinization. But a few cases and the observations of one man alone in the treatment of tuberculosis cannot and should never be considered conclusive. Any one having a new remedy for tuberculosis can delude his patients, if they don't delude themselves, into believing that the new remedy has done them some good. The inventor of a remedy often unconsciously hypnotizes himself into a belief in the efficacy of his discovery. Therefore, I wish simply to give my ideas on the subject, describe the modus operandi and, since it is perfectly safe, ask my fellow practitioners to try it on as large a scale as possible in early, moderately advanced, and even far advanced cases, and after a thorough trial send me their reports. That the results will be best in the early cases must be evident; that the results must be better when the general rest treatment in the open air and the proper hygienic, dietetic and symptomatic treatment are carried out at the same time, is also obvious.

The intelligent cooperation of the patient can only be obtained by explaining to him at length the object of the procedure. He may be told that it may take some time before he can perceive any improvement, but that it can in no wise be injurious to him, and that if he feels the slightest discomfort he should merely stop it. He must be assured that it cannot bring on a hemorrhage although a hemoptysis may occur, as it does in all sorts of treatment, but that it is more likely to prevent one. When one occurs, the quiet and diminished respiratory movements will help the coagulation of the blood and arrest the hemorrhage because of diminishing the movements of the bleeding lung.

Two patients of mine who had had bloody expectoration, and who stated that it always lasted many days, assured me that this quiet and diminished breathing shortened the usual duration of their blood spitting considerably. Of course, we all know that a hemorrhage or bloody expectoration may stop without any medication or other therapeutic means. General rest alone often suffices; nevertheless, it is quite logical to assume that respiratory movements being diminished in number, and the respiration being restricted to the lower portion of the lungs, rarely invaded by tuberculosis, may have a very beneficial influence. Except shortly after hemorrhage or as long as the patient still has bloody expectoration, he should be encouraged in the ingestion of plenty of pure water, at least eight tumblerfuls a day, between meals. I noticed that those of my patients who obeyed this order were better able to reduce their respirations, and do it for a longer time, than those who were neglectful in this matter.

MODUS OPERANDI.

At the beginning of the treatment the patient lies on his reclining chair or preferably in bed with his head low. Later on, he may be able to resort to the method of breathing in a comfortable sitting or even occasionally in a standing position. The patient should be told to imagine that the respiratory movement begins in the toes of his right foot, traveling gradually upward as far as the diaphragm on the right side, then goes over to the left side, stops there for a second or two and then gradually descends during expiration on the left side. While this breathing from the toes upward and as far as the abdomen is of course merely imaginary, it results in a diaphragmatic breathing, and whatever quality of air is inhaled passes mainly through the lower portions of the lungs, while the upper portion, where the tuberculous lesions are usually located, are put at comparative rest. Lastly, the physiological relation of five for inspiration and four for expiration is maintained.

In the article mentioned above; Sewall says: "When respiratory movement is limited to the diaphragm it is the very bases of the lungs that move most widely, the extent of motion rapidly diminishing upwards. When the upper chest expands, respiratory motion involves the upper lobes in proportion to the excursion of the underlying ribs. Now, it is familiar enough that, broadly speaking, pulmonary tuberculosis is a disease of the upper part of the lungs, its intensity being concentrated between the hilum and the extreme apex. Remembering the data of our argument, the deduction is obvious that were we able to inhibit respiratory motion in, say, the first four ribs, we could, without seriously impairing the vital capacity of the chest, so restrict the motion of the principal areas of pulmonary disease that distribution of the toxins therefrom would be greatly reduced."

The most satisfactory results from this physiological adjuvant to the rest cure in pulmonary tuberculosis can naturally be obtained in a sanatorium or hospital where the patients have come, so to speak, to occupy themselves with getting well. In a closed institution the tuberculous patient very often becomes depressed because of lack of employment and wishes he had something to do. With watch in hand or clock before him, he can occupy his time and help toward the cure by limiting his respiratory movements, thus giving rest to his lungs that they may have a chance to heal. However, satisfactory results can also be obtained in private practice. Here we must consider the factors of personal equation. The family physician, having the absolute confidence of his patient and knowing his peculiarities and state of mind, can often accomplish a good deal more, where psychic and nervous elements are involved, than the institution physician. I have had private patients who became intensely interested in this procedure, and they were rewarded for their efforts by a gradual diminution of distressing cough, fever, nightsweats and pain. The more confidence and peace of mind, the more quiet and rest of body we can give the patient suffering from pulmonary tuberculosis, the greater will be our success.

Every student of tuberculosis knows that if he could put every case of early tuberculosis at complete rest and also limit, as much as possible, the movements of the involved area, we would have fewer advanced cases. In my early career I taught respiratory exercises as a prophylactic measure in tuberculosis and I do so still; but as a curative means, I feel more than ever that anything which will put the inflamed lung at rest, if even only at comparative rest, is the ideal treatment in the majority of cases. When, in addition to the restricted respiratory movements, the patient trains himself to cough only when the accumulation of pulmonary or bronchial secretions demand it, he will be doubly benefited.

It may be asked whether there are any contraindications to this type of breathing. If pain is caused by the diaphragmatic breathing or, if present, is accentuated thereby, it is a decided contraindication. The pain may be due to adhesions between diaphragm and pleura on the affected side or to an acute pleurisy elsewhere. A further contraindication is that exceedingly rare condition in which the primary involvement begins in the lower lobes, or where the process has extended to that region in the terminal stage.

As to the psychic effect of this treatment making the patient more contented and restful in mind, there can be no doubt. Many authorities for whom I have demonstrated the exercise thought this feature as important as obtaining the local rest of the invaded lung. Dr. John W. Turner, the consultant in tuberculosis of the U. S. Veterans' Bureau, put it very tersely when he wrote me recommending a thorough tryout of the procedure: "It would seem that this method of limiting the ventilation of the upper portion of the lungs should secure not only local rest to the lung, but also serve as an inspiration and give the patient something specific to do during his repose in bed or on the reclining chair while taking the cure."

May I hope that this seemingly most rational treatment will prove as successful in the hands of many as I believe it to have been in mine.

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16 WEST NINETY-FIFTH STREET.

Roentgen Treatment of Diseases of the Generative Organs

By I. SETH HIRSCH, M. D.,
New York.

The use of the x ray as a therapeutic agent in diseases of the female generative organs is no longer new. Already a vast literature, experimental, biological, röntgenological and surgical has accumulated on the subject, but among the profession the method of application of treatment and its limitations, is not generally understood.

After Albers-Schönberg's discovery in 1902 of the sterilization effect of the rays on the testicles of rabbits, and Halberstadter's demonstration of the greater sensitiveness of the ovary of the female of animals to the agent, it was not long before the occurrence of similar changes in human beings was proved and not long before a mass of evidence had accumulated to prove that the application to the pelvic structure of a certain x ray dose caused temporary or permanent cessation of menstruation.[1]

It is to this end that the x ray has its greatest field of applicability. The gynecologist and the radiologist are both concerned in this application of the x ray as a therapeutic agent, and a close cooperation between the two is essential if effects are to be obtained and the treatment is to be properly and honestly applied. Without a correct diagnosis, without proper control by the gynecologist, without a proper selection of cases, the radiologist works blindly and often to the detriment of his patient. In fact, the radiologist is but the assistant of the gynecologist in these cases. The knowledge of the actual pelvic conditions must come from the gynecologist and the keener his diagnostic ability, the closer his scrutiny of the case, the more effective are the results and the higher the percentage of cures.

In reference to the radiologist, there is this to be said—that he must apply the rays with brains and talent; that, although certain fundamentals must be adhered to, which will be indicated later, and which are the essentials of technic, he must remember that he has a living human being to deal with, who responds and reacts in manifold ways to the application of this powerful agent.

What is the function of the gynecologist in this cooperative treatment? The answer will define for us the limitations of the applicability of this treatment. The function of the gynecologist is to select the cases for treatment.

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[1] The first to apply the röntgen ray for the treatment of uterine fibroids was Foveau de Courvelles (1904). Longfeller (1906) was the first to make definite observations upon the menstrual changes produced by radiation of the generative organs. Albers-Schönberg (1909) was the first to attempt to apply a definite systematic technic to this therapeutic procedure. Kronig and Gauss carried the technic a step further by their introduction of filtration with aluminum (the use of which was first suggested by Thompson) and the dosage through numerous ports of entry. Friedrich, Seitz, and Wintz showed the importance of the secondary radiations in the tissues, and indicated methods of increasing these by the use of higher voltages, heavier filtration and greater focal distances and larger fields. They also established a unit of dosage.

Of the five great causes of uterine bleeding, pregnancy, infection, displacements and lacerations, neoplasms of the uterus and ovaries, and endocrine disturbances (which are usually ascribed as the cause where no gross pathological change is discernible and which are due to dysfunction of ovary, thyroid, hypophysis or adrenal) we are concerned with the latter two only. The remainder are not within the province of the radiotherapist. Of the ovary it may be stated that dysfunction of this organ is an overwhelmingly important factor in the pathogenesis of affections of the generative organs.

CONDITIONS IN WHICH X RAYS SHOULD BE USED.

The x ray is applicable to the treatment of the following conditions:

1. Excessive or prolonged hemorrhage:
    a. From a uterus showing no gross pathological lesions, at puberty, at the menopause, during the whole child bearing period.
    b. From a uterus showing pathological changes.
2. Benign tumors.
    a. Fibroids of the uterus.
    b. Myofibrosis.
3. Malignancy.
    a. Carcinoma.
    b. Sarcoma.
4. Sterilization.
    a. For severe dysmenorrhea with infantile development of the uterus.
    b. After Cæsarean section.
    c. For osteomalacia.
    d. For systemic diseases, tuberculosis, carcinoma (extrapelvic) and heart disease.
    e. For social indications.
5. Diseases of the vulva.

Having selected the cases, the radiologist applies a certain dosage of rays to the pelvic organs. In order that the rationale of the method be clearly understood, it is necessary to recall certain primary considerations.

1. That the reaction of the cell depends upon the absorption of x rays. 2. That the reaction of the cell is apparently the same to rays of different wave lengths, if the same amount of energy is actually absorbed. 3. That the cells vary in their reaction to the same amount of energy absorbed, certain cells being destroyed, others stimulated to growth, others showing no changes. 4. For certain cells, both malignant and benign, the amount of radiation of a certain wave length which will cause degeneration and death has been established. 5. That applying the ray as a therapeutic procedure both the reaction of the organism as a whole to the radiation and the local effect on the organ treated must be studied. The general effects are due to the entire absorption by the portion of the body irradiated, while the local effects are the result of the varying amounts of radiation reaching the various tissue layers.

If the amount of energy of a certain quality which will cause the degeneration and death of the normal or aberrant cell is established, we know the dose which will give the maximum effect. This is comparable to the effect of the maximum dose of a drug. The maximum dosage may be applied in one continuous period (massive method), or it may be divided into several periods (the fractional method). The biological effect of the fractional radiation is cumulative. The x ray acts in small doses to stimulate, in moderate doses to inhibit, and in large doses to destroy. Normal and pathological tissues differ as regards their reaction to the radiation. The lymphocytes and glandular tissue are more sensitive than the connective tissue cells; the ripe graafian follicle is more sensitive than the spermatoza, skin more sensitive than mucous membrane, while muscle fibre and brain tissue are relatively insensitive. So also, pathological tissues vary in their sensitiveness to the ray.

The sarcoma cell requires only sixty to seventy per cent. of the dose of the carcinoma cell for its destruction. Tumors of embryonal cell origin are relatively susceptible. Ovarian carcinomata of embryonal origin are very sensitive to radiations. The rodent ulcer or basal cell epithelioma responds to a smaller dose than does the squamous cell epithelioma. The Hodgkin's gland responds to a smaller dose than the tuberculous gland.

The more vascularized a growth the more susceptible it is to radiation. In general the greater the karyokinetic activity and the shorter the karyokinetic interval the more sensitive is the cell to radiation. There is, therefore, no one general standard maximum dose.

TECHNIC.

Until recently, because of the lack of accurate methods of measurement, the technic of the application of the radiation to the treatment of pathological conditions of deep structures was more or less a matter of individual experience and observations. No precise data based on scientific measurements were possible. Through the use of instruments of relative precision fairly exact data are now obtainable and the entire technic is being established on sound scientific basis.

THE PHYSICAL DOSE.

This may be defined as the energy absorbed in a volume unit of substance. It is directly proportional to the surface energy of the radiation and indirectly proportional to the hardness. It is estimated by subtracting the quantity of energy remaining on the under surface of the absorbing media from the total energy falling on the upper surface of the media. Such a unit of physical dosage is, however, the average dose and it becomes necessary to distinguish, a, the surface dose, that is, the dose absorbed by a very thin uppermost layer of the irradiated medium from the, b, deep dose, the energy absorbed in a very thin lower layer of the absorbing media. The surface dose is the intensity of the energy falling on a square centimetre of surface in a unit of time, whether this is on the upper or lower surface.

If all structures reacted similarly to an equal dose of the x ray, the technic of treatment would be simple. A single dose to the area in which the involved tissue existed would be sufficient. This is not the case. We are limited in the application of the ray by the skin, a barrier which must be taken into consideration in making our attack. The administration of such a single dose as might cause a severe skin reaction (superficial or surface dose) might have but little effect on the organs located at a depth. There are many factors which must be taken into consideration in the determination of the superficial and the deep dose. Before these can be considered, it is necessary to understand certain primary conceptions relating to dosage.

THE ESTIMATION OF AN ERYTHEMA DOSE.

Since it was found that the amount of chemical and biological action produced by the x ray is in direct proportion to the amount of electrical energy applied to the tube, and since with modern apparatus it is possible to measure this, and since the method is more accurate than the methods previously used and more easily applied, the standard erythema dose, that is to say the quantity necessary to produce an erythema of the skin in a certain number of days after exposure, may be measured by estimating the voltage or spark gap, the milliamperage, the time and the distance. The measurement by chemical, photographic and color reactions are in this country at least abandoned.

This method is of value only for the estimation of the skin effects. It gives no clue whatever to the dosage underneath the surface. Estimations by these formulas are of value in protecting the skin from deleterious effects when the lower voltages are used.

The energy absorbed, therefore, is the deep dose, subtracted from the surface dose and divided by the volume of the absorbing media. If the thickness of the irradiated layer is made equal to the semireducing layer value of the ray (that height of a layer of water which will reduce its intensity to half), then the intensity of the energy at the depth is half that of the surface energy. If the hardness of the radiation is expressed in semireducing layer values, the physical dose is inversely proportional to this. Now it has been established that the semireducing layer value is equal to the absorption coefficient of the ray for the same absorbing media. Therefore, the physical dose may also be expressed in terms of surface energy and absorption coefficient to both of which factors it is directly proportional.

THE BIOLOGICAL DOSE.

The biological dose is the physical dose multiplied by the sensibility coefficient of the tissue. If, therefore, the sensibility coefficient of a certain cell is known, then the biological dose may be estimated from the physical.

According to Wetterer the ovarian follicle is seven times more sensitive to the ray than the skin, ten times more than connective tissue, twenty times more than muscular tissue. Myoma cells are much more sensitive than normal muscular cells and more sensitive than the skin. Since the skin acts as the barrier which must be taken into consideration in estimating the dose, the biological skin dose has been taken as a unit of dosage. Taking the sensibility coefficient of the skin as 1, the sensibility coefficients of the remaining tissues may be estimated.

1.	For the skin	1.0
2.	For the ovary	2.5
3.	For the sarcoma cells	1.6 —1.4
4.	For the carcinoma cells	1.0 —0.8
5.	For the intestines	0.74
6.	For the muscles	0.55
7.	For the tuberculous tissue	2.0

There was, until recently, no practical method of measuring the deep biological reaction by physical means. It cannot be estimated by mathematical formulæ because of the essential rôle played by the secondary radiations (scattering) in producing the biological effects below the surface. Recently, however, the ionization chamber has been made practical for this purpose.

By this iontoquantimeter, as it is called, estimations of the number of units of ionization required to obtain a skin erythema have been estimated.[1] This value was then itself taken as a unit. Now, by applying the iontoquantimeter to various levels of human tissue irradiated, the intensity of the rays reaching the depth at various levels, in percentages of the intensity necessary to produce the skin unit have been determined. It is thus that the dose in terms of surface intensity for various conditions was estimated.

Calling this radiation necessary to produce such a reaction as one hundred per cent., Seitz and Wintz have with this dose as a basis determined a biological dosage which, in spite of its deficiencies, is nevertheless useful.

TABLE I.

	Dose	*Per cent.*
1.	Skin unit dose	100
2.	Castration dose	35
3.	Sarcoma dose	60-70
4.	Carcinoma dose	90-110
	Irritation dose for carcinoma	35-40
5.	Intestinal dose	135
6.	Muscle dose	180
7.	Tuberculosis dose	50

These figures for castration and malignancy doses should not by any means be accepted as absolute. Depending on the characteristics of the individual and the characteristics of the type of malignancy the doses given in the table may need considerable modification. There is surely a certain percentage of sarcoma and a greater percentage of carcinoma which is not affected by the above dosage. There is considerable variation in the sensitiveness of the ovary to radiation, even in individuals of the same age.

THE DOSE QUOTIENT.

The dose quotient is that quotient of surface dose over deep dose and gives the ratio between the surface dose and the deep dose. The aim of the deep therapy technic is to keep this quotient as small as possible, or, in other words, that the dose at a particular depth small approach that which was received by the surface at the time of administration as closely as possible. The value of the deep dose is expressed in percentage of the value of the surface dose. The deep dose percentage is the reciprocal of the dose quotient. The aim in modern therapeutic technic is to get as high a deep dose percentage as possible. Striving for this has been responsible for the striking changes in technic. The value of the dose depends on three factors: 1. On the absorption of the rays in the overlying tissues. 2. On the dispersion of the radiation. 3. On the scattering of the radiation.

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[1] The "skin erythema" of Seitz and Wintz which is the basis for their measurement is apparently too low.

1. For the same thickness of absorbing media and the same focal distance, the dose quotient will be smaller the less the absorption by the media irradiated, that is to say, the more penetrating the primary radiation. The characteristics of the primary radiation may be changed: a, through increasing the penetration; b, through filtration, attempting to attain homogeneity.

2. For the same thickness of absorbing media and the same ray quality the dose quotient will be smaller the further the source of radiation is from the absorbing object. Increasing dispersion, therefore, diminishes the difference between the surface and the deep dose.

3. For the same thickness of absorbing media and the same focal distance and with the same ray quality, the dose quotient will be smaller the greater the scattering. The production of secondary radiations in the tissues which tests have shown greatly improves the effective dosage is increased, a, through increasing the focal distance, b, through increasing the size of the portal.

1. THE CHARACTERISTICS OF THE RADIATION.

The penetrating quality of the rays depends on the voltage by which the tube is energized. For standardization of technic and for relative accuracy in estimating dosage, practical homogeneity is necessary. A ray which is no further hardened (average penetration unchanged) after passing through ten cm. of human tissue, a desirable qualitative homogeneity for therapeutics, can only be obtained by higher voltages and heavier filtration. Until recently the voltages used for the generation of x rays with the tubes available varied from eighty to one hundred thousand volts. Recently, however, transformers have been developed which generate from one hundred and eighty thousand to two hundred and eighty thousand volts, with the production of rays of very great penetrating power, making it possible to deliver a considerable quantity of qualitatively homogeneous radiation in the tissue depth and to produce considerable scattered radiation, which augments the percentage of radiation absorbed at the depth. When qualitative homogeneity is maintained the reaction of the different tissue is then dependent only on two variables ,intensity and time.

The time necessary to produce a given dose with various voltages, other factors being the same, may be estimated as follows:

Gap	20 cm.	25 cm.	30 cm.	35 cm.	40 cm.
Time	7 1/2 min.	5 1/6 min.	3 1/6 min.	2 1/2 min.	1 5/6 min.

It is thus seen that it takes four times as long to get the same dose with an eight inch gap as it does with a sixteen inch gap. The translation of spark gap equivalents into numerical voltage values is responsible for much confusion in thought. The mean square voltage has usually been stated in this country. Abroad the peak voltage has been given. The measuring of air gaps between blunt points has been used in this country, while abroad the measurement is made between point and disc. Because frequency and wave shape have no appreciable effect in varying the discharge between sphere gaps, these are now being utilized for the measurement of voltages. With the proper sized spheres, voltages from 10,000 to 500,000 may be measured with an accuracy of about two per cent. (Kaye). The sphere gaps read peak voltage. The values are about as follows:

Blunt points	*Needle points*	*Sphere gaps*	*Peak voltages*
10 inches	6.96	1.6	110 K.V.
12 inches	9.4	2.25	140
14 inches	11.1	2.62	160
16 inches	13.6	3.50	195
17 inches	14.0	3.64	200
18 inches	15.5	4.25	220
20 inches	17.8	5.32	250

The x ray spectrometer measurements show a simple relationship between the voltage applied to the tube and the shortest wave length of the emitted radiation, namely, that voltage is equal to 12,400 divided by the wave length in Augstrom units.[2] By measuring the wave length of the radiation the maximum effective voltage applied can be determined and vice versa, by knowing the maximum voltage the wave length can be determined by dividing 12,400 by the voltage. Thus with a 200,000 peak voltage there would be a wave length of .062 A°. It would perhaps be advisable in the future to speak of wave lengths of the radiation.

FILTRATION.

To still further increase the absorption at the depth, the ray is filtered with the view of cutting out the rays of longer wave length. The filtration utilized with the old technic consists of three to five millimetres of aluminum. With rays of greater penetrating power, heavier filtration is necessary. Ten millimetres of aluminum, five tenths millimetres of copper or zinc are used.

To obtain practical homogeneity so that the ray is not changed after passing through ten cm. of water or bakelite, a five mm. zinc filter is necessary. Such filtration is practical only with currents of very high voltages, such as are being used in the most modern therapeutic methods.

The socalled deep dose percentages with various gaps and filters have been estimated as follows:

	Equivalent spark gap		
Filter	*30 (12 in.) Percent.*	*35 (14 in.) Percent.*	*40 (16 in.) Percent.*
Unfiltered	..	5.2	..
Aluminum—3 mm. ...	..	12.2	..
Zinc—0.5 mm.	18.5	19.	20.5
Zinc—1.0 mm.	..	20.5	..
Zinc—2.0 mm.	..	22.	..
Copper—1.0 mm.	21.4	..	22.5
Copper—2.0 mm.	21.3	..	22.6

These measurements have been obtained by Seitz and Wintz by iontoquantimeter tests.

FOCAL DISTANCE.

The further the source of radiation is from the absorbing media for the same quality of radiation, the smaller the dose quotient, in other words, the less the difference between surface and deep dosage. With the same radiation through the same portal, the absorption at a depth of three centimetres will vary with the focal distance as follows:

At a depth of 3 centimetres	*At a depth of 5 centimetres*	*At a depth of 10 centimetres*
30 cm.—77%	30 cm.—70%	30 cm.—47%
50 cm.—86%	50 cm.—79%	50 cm.—59%
100 cm.—93%	70 cm.—83%	70 cm.—65%

With the increase in focal distance there is a loss in intensity which varies inversely with the square of the focal distance. To get the same intensity at an increased distance, it is necessary to increase the time directly as the square of the distance, with certain exceptions, which will be noted later.

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[2] The Augstrom unit is equivalent to one hundred millionth part of a centimetre.

The appended table of Voltz gives the intensity and time factors for various distances, from 23 to 100 cm., the focal distances usually employed.

F. D.	23	25	28	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
I.	1.00	0.85	0.67	0.58	0.43	0.32	0.26	0.21	0.17	0.15	0.12	0.11	0.09	0.08	0.07	0.065	0.060	0.055
T.	1.00	1.18	1.48	1.70	2.32	3.02	3.83	4.73	5.72	6.81	7.99	9.26	10.63	12.10	13.66	15.31	17.09	18.89

Checked by iontoquantimeter measurements, Wintz states increasing the focal distance from twenty-three to fifty centimetres, the time is five to eight per cent. less than calculated and trebling the size of the field under the same conditions the time fourteen to eighteen per cent. less. Beyond a focal distance of fifty centimetres, the time required to obtain a skin dose is about twenty-five per cent. longer than calculated. As judged by skin reaction and epilation this apparent exception to the law above stated cannot be corroborated. Judged by biological tests the distance square law may be said to be valid with this consideration. With long focal distances and small fields the rule does not hold. But with long focal distances and large fields it does hold. Seitz and Wintz use small fields. The size of the focal spot on the anticathode plays an important part in these considerations.

PORTALS.

The absorption quotient may be improved by increasing the size of the portal. This also increases the width of the cone of rays and a greater extent of tissue is radiated with an increase in the scattering. This scattering comes not only from the tissue overlying the object treated but from the tissues beneath. The shorter the wave length of the primary beam the greater the scattering. It has been estimated that as much as fifty to one hundred per cent. can be added to the dose in this way.

The extent to which varying the size of the portal varies the percentage of absorption at the depth is indicated in the accompanying table.

With a peak voltage of 200,000 and one and a half milliamperes of current with a filtration of 1.3 copper the percentage of absorption at various depths for different sized portals for various focal distances is as follows:

Portal	*Depth*					
	1 cm.	*2 cm.*	*3 cm.*	*5 cm.*	*7 cm.*	*10 cm.*
	30 CM. FOCAL DISTANCE					
5.7 x 7.6	90	80	70	60	50	40
9. x 12.	90	80	75	65	55	45
18. x 24.	95	90	80	70	60	50
	40 CM. FOCAL DISTANCE					
6.1 x 8.1	91	82	75	65	55	45
9.7 x 12.9	92	83	80	70	60	50
19.3 x 25.7	95	91	85	75	67	55
	50 CM. FOCAL DISTANCE					
10.1 x 13.4	93	90	80	72	65	55
20.1 x 26.8	95	92	88	80	72	60
	60 CM. FOCAL DISTANCE					
10.4 x 13.8	95	90	80	70	65	55
20.7 x 27.6	97	93	90	80	74	63

By increasing the focal distance either to 80 or 100 cm. the dose at 3 cm. may be increased from ninety to ninety-five per cent. These figures would indicate that in order to approximate the hundred per cent. deep dosage the more superficial the growth, the longer the focal distance and the larger the portal necessary, while the deeper the growth the more numerous and smaller the portals.

Increasing the size of the portal of entry from 1.5×2 cm. to 10×15 cm. gives nearly four times the dose at a depth of ten cm. while at a lesser depth of three cm. the increase is about sixty per cent. Under certain conditions, by increasing the focal distance to either eighty or one hundred centimetres, the dose at a depth of three centimetres can be increased from ninety to ninety-five per cent., which is over a maximum sarcoma dose and a minimal carcinoma dose. The maximum effects may, therefore, be obtained by combining the requisite portal with the proper focal distance.

The general findings of Dessauer regarding this latest technic of röntgen therapy is of interest. 1. With hard rays and large portals, deeply placed and centrally situated points receive more radiation through scattering from the direct rays. 2. While the direct intensity decreases with the depth, according to rules, the scattered intensity increases with the hardness, with the size of the radiated volume, with the proximity of the area to the central radiation with the thickness of the overlying layer. 3. Definite intensities due to scattered radiation are present lateral to the directly radiated volume.

LOCALIZATION.

The ideal method of application is that which concentrates the x rays upon the particular organ it is desired to affect. Such concentration of energy can only be obtained by the most exact orientation regarding the position of the organ in the particular individual. Thus, if it is the ovaries upon which the radiation must be concentrated in the treatment of uterine hemorrhages, it is advantageous to locate the ovaries and to administer the dose directly to these organs.

The treatment as generally administered in practice is not so accurately localized and the effect obtained is through secondary and scattered radiation upon the organ attacked. With a view to more accurate direction of the radiation, the technic for the application to ovaries, includes their localization. It becomes necessary then to determine the following facts: 1. The relative position of the ovaries to each other and their projection upon the surface of the body in relation to certain fixed points. 2. The depth of the ovaries from the external abdominal wall.

Hoehne and Lizenmeyer have determined the position of the ovaries in relation to the interspinous line and the median line. By means of bimanual examination in the living, controlled by operative findings, measurements have been made indicating the position of the ovaries in anteflexion both in the nonpregnant and the gravid uterus and in retroversion of the uterus.

The average distance between the ovaries is about nine and a half centimetres. In individuals with small transverse measurements of the pelvis, it may vary from seven to eight centimetres; in those with very large and broad pelves it might be as much as thirteen centimetres. The right ovary is usually more lateral than the left, five to four and a half centimetres. The more the uterus is anteverted, the greater the displacement of the ovary below the interspinous line.

The distance between ovaries in the second and third months of pregnancy is the same as in the nonpregnant state, nine and a half centimetres. This also holds true for relationship of the right and left ovaries to the median line. In the second month the average is about five centimetres, for the right and four and a half centimetres for the left; the third month five and one third centimetres for the right and four centimetres for the left. As the uterus enlarges the interovarian distance increases; in the fourth month it measures twelve centimetres; in the sixth month eighteen centimetres. The distance below the interspinous line is relatively great in the second month but gets smaller with increasing size of the uterus, in spite of greater anteversioflexion and at about the fourth month is above the line. The interovarian distance grows smaller in the retroverted position of the uterus, and so does the distance below the interspinous line. The measurements hold true only in the absence of a fixation of the ovaries by an inflammatory process.

The measurements given above permit us to state that in the average case—a square three centimetres in size so drawn that its inner border is three centimetres from the median line, its upper border at the interspinous line, will in ninety per cent. of the cases include the position of the ovary. In practice this square is used as a centre for a portal six by eight centimetres in size. The depth of the ovary below the skin was similarly obtained. The distance varied from four and a half to seven and a half centimetres. On the average it was six and a half centimetres on the right side and about six centimetres on the left side.

Though no marked displacement of the ovaries occurs with the myomata of average size, in the presence of large myomatous uteri the localization of the ovaries is difficult, if not impossible.

Therefore, in the square outlined, it is necessary that the ray be so gauged that the required biological dosage is administered at a depth of six centimetres.

In the localization of the uterus for carcinoma, the maximum depth of the organ is considered to be ten centimetres beneath the skin. Taking into consideration the necessity of reaching the pelvic lymph nodes and of applying the ray to the whole pelvis in carcinoma, the localization is unnecessary. In the localization of the uterus for carcinoma, the maximum depth of the organ is considered to be ten centimetres beneath the skin. Taking into consideration the necessity of reaching the pelvic lymph nodes and of applying the ray to the whole pelvis in carcinoma, accurate localization is unnecessary. But in certain tumor formations where localization becomes necessary, in order that the radiation be directed with accuracy, the area to be irradiated must be accurately mapped out. This is essential so that, firstly, all parts of the tumor may receive the required radiation and secondly, that no normal tissue about the tumor receive an overdose. To this end such devices as those of Holfelder (1) or Dessauer (2) may be utilized, the latter method, consisting of carefully constructed charts, giving the dosage at various centimetre levels, with various types of radiation, through various portals, with various filters, based on numerous measurements made with photographic emulsion. Its accuracy in practical work has not, however, been completely verified, though it is extremely useful as a basis for dosage. Where crossfiring becomes necessary, the various cones of radiation must be transferred to the tracing of a cross section of the part of the body and the portals so selected as to obtain sufficient radiation to all parts of those tissues which are under treatment without overdosage to the other parts which are not under treatment.

APPLICATION.

As a rule the skin of the lower abdomen from the umbilicus to the pubis is divided into a number of areas or portals of entry. The number varies, depending on the condition under treatment, and the dose desired at a particular depth. With the old technic the portals were very small, and the whole of the lower abdomen was marked off. Through each such portal, with the voltage equivalent of a nine inch gap, was applied five milliamperes of current with filtration of four millimetres of aluminum at a distance of twenty-five centimetres in ten minutes by a method the intent of which was to crossfire. Though with this technic, in which there was a great aimlessness in crossfiring, castration was accomplished with ease, since the thirty-four per cent. absorption was thus attained. Nevertheless the malignancies were practically unaffected. The iontoquantimetre measurements indicated the necessity for greater, more accurate and more certain dosage, for such conditions and a complete revision of the technic followed. Now the size of the field depends upon the condition treated and upon the depth of the focus to be reached by the particular radiation at hand. The number of portals depends on the biological dose desired. It may be administered through one portal as for castration under certain conditions, or through many portals as in carcinoma of the uterus, with lymphatic involvement.

When the requisite portals have been mapped out, a quantity of radiation is applied at a certain focal distance, through a certain portal and given a certain direction in order to reach the tissues under treatment. The radiation is administered over such a period of time as to obtain the requisite absorption and administer the effective dose at the particular depth at which the structure to be treated lies limited, of course, by the skin reaction. As a rule for benign conditions the skin limit is a first degree reaction but in the treatment of carcinoma it is necessary to administer such a dose through each area as will produce a second degree reaction in the skin, even with vesiculation and complete alopecia. The regeneration of the epidermis, if the dosage is carried no further, is complete without sequela and the skin restitutes to normal. There are at the present time two great methods of dosage: a. By complete dosage at one session; b, by divided doses through several lesions.

(*To be concluded.*)

Fugacious Edema of the Mastoid Region with Paroxysmal Hemoglobinuria*

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The case which occasioned this communication concerns a young boy eight and a half years old who had scarlet fever ten months previouly with nephritis from which he made a good recovery.

Case.—On December 22, 1921, he went skating at the Palais de Glace in Paris, where he contracted a cold. The next day I was asked to see him, for he had a slight rise in temperature (37.9° C.) and complained of pain in his right ear. I found a slight hyperemia of the throat and drum and prescribed warm moist applications over the ear and mastoid. In the evening the temperature rose to 38.7° C., but fell the next morning to 37.9° C. and in the evening to 37.3° C. On December 25th I was informed that the child was not doing well, was still complaining of his ear and that a large swelling had appeared over the mastoid. I expected to find a mastoiditis and went prepared to perform paracentesis of the drum. When I arrived at the house, the family physician confirmed what the mother had said. After removing the bandage I saw no swelling, no edema, the mastoid was not particularly painful on pressure, the drum was slightly congested and the whispered voice was heard at three yards distance. The temperature was 37.7° C. The mother and the doctor were both greatly surprised and stated emphatically that there had existed a marked swelling over the mastoid a few hours previously. I thought that they were somewhat inclined to exaggeration and I decided to postpone the paracentesis. Two days later the mother again informed me by phone that the child was in a bad way, that he had had delirium since my last visit (the temperature, however, had not risen above 37.8° C.), that his heart was irregular and that his urine contained blood and albumin (0.20 cgm.).

I was asked to see him again in consultation with the family doctor and Dr. Gaulier. The latter had examined him two days previously and informed me that the case was one of paroxysmal hemoglobinuria and that, besides the albumin and the hemoglobin in large quantities, his urine contained biliary pigment and an abundance of indol and scatol.

This is what the consultant found on the 25th: the patient had had a chill and the temperature was 37.7° C. The right side of the head presented an edema reaching from the suborbital to the occipital region surrounding the mastoid and parietal regions. The heart was arrhythmic, the beat a double regular, a silence, then five or six precipitate beats. The urine was red. Rapid analysis made that day revealed a retention of chlorides from seven to four grams, but the analysis of the twenty-four hour urine made on the following days showed no chloride retention. A water diet, rest in bed and a counterirritant over the kidneys were prescribed.

Preceding this condition the child had remained three days without a movement of the bowels. We know the influence of constipation on the production of indol and scatol.

The condition was then made clear. Under the influence of the cold at the ice palace, the indol and scatol, showing a marked intestinal putrefaction, produced, by absorption into the blood, a hemoclasic and colloidoclasic shock with symptoms revealing a reaction dependent on an irritation of the organo-vegetative system.

This reaction manifested itself by a chill (according to Montagnini (1) the attack of hemoglobinuria is always accompanied by chills, but without fever), by excitation of the vagus (vagotonia), slowness, irregularity and intermittence of the pulse, and by edema. The edema was the forerunner of the attack of paroxysmal hemoglobinuria.

I saw the patient again on December 28th in the evening. His temperature, which was 37° C. in the morning, had gone up to 38.4° C. He had suffered a good deal from his ear during the afternoon. The drum membrane was red and slightly bulged out, the whispered voice was heard at a distance of fifty cm. I thought of performing a paracentesis the next morning, but the temperature fell to 37° C., the pains had completely disappeared, and the drum membrane was less red.

The rise in temperature was certainly due to a concomitant infection with localization in the middle ear, and not to the paroxysmal hemoglobinuria, the latter, according to the authors who have written on the subject, producing no fever when there is no infection. And experimentally, the shock produced by indol and scatol causes the central temperature to fall one degree centigrade (Le Calvé) (2).

This case was doubly interesting to me, because I was giving my attention for some time to the study of indol and scatol in edematous affections of the mucous membranes (rhinorrhea, spasmodic rhinitis, spasmodic cough, asthma, etc.), for in these affections I had nearly always found an abundance of indol and scatol in the urine. I had written to Germany to obtain these substances made synthetically with experimental work in view. The present case, therefore, offered itself to me as the occasion for a preliminary communication on the subject.

These ideas were in germ when in the *Presse médicale* I saw the analysis of a communication made to the Academy of Medicine of Paris by Dr. J. Le Calvé (3), on indol and scatol, hemoclasic shock bodies.

I wrote to our colleague who then kindly forwarded me his thesis (4). This work, as well as one published later (5), contains the description of interesting experiments with indol and scatol from a physioanatomicopathological viewpoint, but the results of which remained unexplainable to the author until the idea struck him that indol and scatol acted not as toxines, but as shock bodies (*corps de choc*). This is proved by the fact, apart from the phenomena observed, that the intensity of the reaction in animals injected was far from proportional to the quantity of the substance employed; a few milligrams at times produced results as demonstrative as those observed after ten to fifteen centigrams. And in spite of the violence of the disturbances manifested, his animals recovered quickly and completely. If the injection is renewed after a short interval, or after one or two weeks or a month, the manifestations remain identical. These two substances, therefore, do not produce the anaphylactic shock, but one more similar to the protein shock.

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*Communication made to the Otolaryngological Society of Paris, January 13, 1922.

It is only recently that Le Calvé renewed his researches on a new basis, guided by the discovery of hemocolloidoclasis, which allowed him to conclude that indol and scatol are shock bodies capable of producing the phenomena of hemocolloidoclasis and that they possess edematogenic power.

It is a well known fact today that edematous conditions are frequent in diseases and syndromes in which hemacolloidoclasis has been found. And this fact has now received experimental confirmation.

"Indol and scatol," says Le Calvé (2), "possessing a real action on the nerve centres, produce in the latter congestive and hemorrhagic alterations and also edematous infiltrations. In the kidneys, the congestion predominates, the edema is not important; the other organs, liver, lungs, spleen, etc., are the seat of intense hyperemia."

And again: "On a subject in a state of shock by indol and scatol, the transudation which chooses spontaneously the central parts, may be turned away to the periphery when intervenes, in the region where one desires to draw it, an excitation of the vasomotor or sensitive nervous system . . . an energetic cooling of the ear by evaporation of ether, prolonged friction of that organ, an inflammatory focus, etc."

We may therefore explain in our case the albuminuria and the presence of biliary pigments in the urine by the congestion of the kidneys and of the liver, the delirium by the congestion and edema of the nerve centres. And I wonder now if the warm applications over the ear and mastoid did not act as an edematogenic irritant. The same question may be asked concerning the otitis, as an inflammatory focus. An affirmative answer is more than justifiable, the explanation having been given us by the experimental researches of Le Calvé. This edema could not have been due to chloride retention, the analyses of the twenty-four hours' urine made daily having shown that there was none, and furthermore chloride edema does not possess the marked character of fugacity in its appearance and disappearance, nor the localization which our case presented. If the warm applications had been made only over the mastoid, instead of over the whole side of the head, it is probable that the edema would have localized itself there. If then I had thought of a mastoiditis requiring an operation, I should have made a mistake, pardonable it is true, for similar cases must be rare and I readily admit that this is the first case of paroxysmal hemoglobinuria that has fallen under my observation.

It is to be remarked in this case that the edema appeared twenty-four hours before the hemoglobinuria. That is the rule according to Montagnini (1) who says: "The study of the hemoclasic shock has clearly shown us how the vasohematic symptoms decidedly precede the classic phenomena of the hemolytic process itself; it has allowed us to emphasize again the independence of the autoanaphylactic and autohemolytic shocks in spite of their intimate coordination, and contrary to the opinion prevalent shortly ago which made the one dependent on the other as a result of the irruption into the tissue circulation of destroyed red blood corpuscles."

Instead of autoanaphylactic, it would perhaps be preferable in our case to say autohemoclasic or autohemocolloidoclasic, although we entertain a strong doubt as to the possibility of such a condition being due to cold alone, according to the ideas of Widal and his pupils (6).

Murri (7) considers the cold only as an occasional cause, the real and necessary one being syphilis, as is proved by the nearly constant positive Wassermann reaction. It is probable that the cause is to be found in the action of shock bodies such as indol and scatol in syphilitic subjects. This may perhaps be confirmed by the study of hemolysis by these substances *in vitro,* and if this phenomenon takes place in syphilitic blood at a different concentration than that required in nonsyphilitic blood, it may turn out to be a very simple diagnostic means. The researches of Hamburger (8) on the issue of hemoglobin from red blood corpuscles show for each salt a certain concentration for which the red blood corpuscles begin to lose their coloring matter. But it is possible that indol and scatol destroy *in vivo* the antihemolysins which Duhamel and Thieulin (9) state the liver normally produces. And therapeutically there may possibly be a means to obtain by intradermic injections of small doses of indol and scatol antihemocolloidoclasic effects.

According to Le Calvé shock bodies, whether indol, scatol or any other body, have a direct action on the organovegetative system (sympathetic and parasympathetic) for which they seem to be possessed with special affinity.

Numerous authors (Richet (10), Arthus (11), Biedl et Krauss (12), Mattirolo and Tedeschi (13), Micheli (14) and others), had observed in all shocks the rapid fall of arterial tension, diminution of the white blood corpuscles (leucopenia) with inversion of the leucocytic formula and disturbance of coagulation of the blood. Other phenomena observed by various authors are: lowering of the refractometric index of the serum, diminution or complete absence of the retractility of the clot, the diminution of hematoblasts (Pagniez and Mouzon) (15) with fibrinolysis more or less marked, flocculation of the micellæ of the serum (Dold) (16 and 17), either by hydratation or by electric discharge (Kopaczewski) (18) and (A. Lumière) (19 and 20), a more marked ruddiness of venous blood, increase of superficial tension and diminution of viscosity (Kopaczewski) (21) and (Muttermilch) (22).

These phenomena, singly or collectively, show a marked disturbance in the physical state of the blood, and this disturbance combines its effects with those of the direct action of the shock bodies. The precosity of the vagosympathetic manifestations is symptomatic of their central origin (Le Calvé). The hemolytic and consequently the hemoglobinuric phenomena follow, and are due to an unstable condition of the hemolytic system (amboceptor, sensibilizing substance and complement), the exact explanation of which offers a complex problem not yet solved.

Indol and scatol are rendered less toxic, it would now be more correct to say less shocking, by the sulphoconjugation which is produced in the liver and which transforms them into indoxyl and scatoxyl. They are then eliminated in the urine as indoxylsulphate of potassium (indican) and scatoxylsulphate of potassium (scatol).

The liver would therefore possess an indopexic function (Gilbert and Weill) (23) and in the hemocolloidoclasic shock due to indol and scatol, there must exist a certain insufficiency of that function, consequently a partial insufficiency of the liver.

The opinion prevails that indol and scatol are the result of intestinal putrefaction by bacterial decomposition of the tryptophan contained in proteid substances. It has also been asserted that they may result from the metabolic disassociation of the tissues. Their origin, as well as their normal quantity in the urine of difficult determination, are now of secondary importance to us, since experiment has demonstrated them to be shock bodies. The question might be asked as to what difference there is between a toxic substance which makes one very ill or kills and a shock body which, by the violence of the hemocolloidoclasic shock also makes one very ill or kills. And the ptomaines of the intestines, may they not act in the same way as indol and scatol?

Shock bodies may accumulate in the organism, either on account of their superabundant production, or by insufficiency of the liver, or again by lack of elimination by the emunctory organs. It is therefore possible that the scarlatinal nephritis, which the little patient had ten months previously, may have had something to do with his attack of paroxysmal hemoglobinuria, his renal filter having perhaps remained a little weak.

The French consultant in the case, Dr. Gaulier, suggested the idea that shock bodies might produce the simple hemocolloidoclasic shock in nonsyphilitics and the hemocolloidoclasic shock plus hemoglobinuria in syphilitics. And this might supply an answer to the question raised by Montagnini (1), viz., if specificity and hemoglobinuria stand together in the relationship of cause and effect, why are there so many syphilitics who, even exposed to the most intense cold, never present this morbid phenomenon?

Silvagni (24) is of the opinion that there are syphilitics who are hemoglobinuric, so to say, *in vivo* and *in vitro*, others only *in vitro*, but they must be considered as subjects in whom the lability of the hemolytic system is latent, although not revealable, even under the influence of the most intense refrigeration. We believe the indolic or scatolic shock to be the link between the two phenomena, and experimentation will prove or disprove their influence in that respect.

It seems to be admitted today by all the authors who have studied this question (Murri) (7), Micheli) (14), (Silvagni) (24), (Datta, Schiassi) (25), (Baginsky, Soltman, Comby, Goeltze, Cima) (26), that paroxysmal hemoglobinuria *a frigore* (Widal, Abrami and Brissaud) (6) is syphilitic.

The Wassermann reaction could not be made in our case, the consultant fearing that the taking of blood might produce a syncope on account of the weakened condition of the patient and the bad state of the heart. It will, however, be indispensable to determine the reaction of the blood of all his sisters and brothers, four in number; if, however, it proves to be negative, it could not invalidate the diagnosis of hereditary syphilis which seems to be evident for reasons drawn from the anamnesis.

The patient had a big liver. The mother had two miscarriages, one vicious presentation, and a lesion of the apex and repeated congestions of the right lung, without tubercle bacilli. Her liver is rather large and she has chloride retention in the blood during her menstrual periods. The latter phenomenon is considered by Dr. Gaulier very characteristic of hereditary syphilis. The maternal grandfather is epileptic. Leredde (27) has recently called attention to the frequency of syphilis in essential epilepsy (six certain cases out of fourteen epileptics), thus confirming the opinion of Fournier who had recognized its syphilitic nature "in certain cases."

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The Conquest of Typhoid Fever at Chickamauga Park, Ga.*

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The purpose of this paper is to detail, as a matter of history, some of the work of the Medical Department of the United States Army during 1917 at Chickamauga Park, Georgia. This includes a study of the conditions, the possible sources of contagion, the history of the cases, and the methods adopted for the control of typhoid fever. I was fortunate enough to be detailed on two typhoid boards and had an opportunity to study each case closely.

The ignorance of sanitation, the disregard of recommendations, and the horrors of the results at Chickamauga Park during the Spanish-American War are too well known, even to the younger generation, to need more than passing mention and then to recall them that the contrast of the present record may be more forcibly shown. There is a legend handed down by the natives of this country that the name Chickamauga was bestowed on the section by the Indians and meant "The valley of death." For this reason it is said to have been shunned by them as a camping ground.

In the spring of 1917, Chickamauga Park was a Government battlefield, beautifully situated in a rolling, hilly country, picturesque in its drives, with tall trees, descriptive charts, and atrocious monuments. At one end of the park, Fort Oglethorpe was situated. This was the permanently constructed home of the Eleventh Cavalry with its barracks, hospital of forty beds, parade grounds, officers' quarters, stables, sewage disposal plant, and deep well water supply. It was an adequate and partially safe home for one regiment with its peace time quota. In May, 1917, when extensions began at the camp the Eleventh Cavalry had been away for months; the Post had been practically abandoned, occupied by about two hundred and fifty German war prisoners and the necessary prison guard. A part of the cavalry had returned and were camped on the side of a near by hill in tents. The surroundings were those of peace time character and the hospital contained about twenty patients, most of whom were suffering from chronic disease, having been returned from the border. The sanitary reports had been going in to the Surgeon General's Office regularly from this hospital and religiously every month, it was noted that the water supply was good, the sewerage adequate, etc., and the same had been copied from month to month for several years past.

Early in June, 1917, signs of life sprang up all over the park. New buildings of the one story cantonment type were constructed in units by the hundreds with all the necessary pipe lines for water and sewerage. The men soon began to arrive for the various training units. On June 1, 1917, there were about three thousand men, all told, at the post. The following figures supplied from the records show the daily average census and the rapidity of growth for the next four months: July, 23,132; August, 28,416; September, 27,481; and October, 30,111. The park was divided into several different camps and never became one division during its entire existence. At one time three brigadier generals were in command at different headquarters. At one headquarters, at one time, a major general was in command while at another time a second lieutenant commanded the same post. This necessitated much change of organization and personnel. No officer ever acted as a division surgeon nor was there a single division sanitary inspector. The problems of sanitation remained the same regardless of who was in authority or what the personality or ability of the medical officer might be. The various commands often overlapped, resulting in considerable friction. It must be said that as far as the recommendations of medical officers to commanding line officers in regard to preventive measures against typhoid fever were concerned, their cooperation was all that could be desired. The various generals and colonels were ever receptive, sympathetic, in fact eager, left everything to the medical department and backed them to the limit. As one general expressed it, "Give us fighting effectuals and we'll carry out every recommendation you make." Second lieutenants often were not as eager to carry out these orders, but when the attention of correcting authority was called to their indifference they always received proper reprimand.

It would seem that some detail along lines possibly aside from the main subject is in order, that the result may be more clearly shown. I was assigned to the post hospital laboratory in June, 1917, and found an equipment, archaic to say the least. Necessity was the mother of invention and soon by one makeshift or another real work started. It was first found that the tap water supplied the hospital was constantly polluted. Investigation revealed two sources of main supply. About a third of the quantity used came from wells averaging four hundred and fifty feet in depth. Examination of these wells revealed a heavy contamination with Bacillus coli at all times. This supply was being chlorinated, the amount of bleach, judged at the discretion of the engineer, probably was often underestimated. The remaining two thirds of the supply came from the Tennessee River after filtration and chlorination and was never found to contain Bacillus coli.

At first thought it would seem a simple matter to clear this up, but it took several days and considerable change even to main piping before the water was entirely potable. The local source required as much as eighteen pounds of bleach to the million gallons of water on some days before it was free from Bacillus coli. During the work the hearty cooperation of the post engineer, Mr. Mansfield, was of great value. The task required many trips of inspection by various officers and considerable laboratory work. This may be said to be the first step accomplished. It was finished by the middle of July so that potable water was furnished the entire camp.

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*Presented before the Philadelphia Pathological Society, October 23, 1919. From the U. S. General Hospital No. 14, Fort Oglethorpe, Ga., and the Department of Laboratories and Research Medicine, The George F. Geisinger Memorial Hospital, Danville, Pa.

I should like to mention at this point three officers of the regular service to whom not the entire credit but a great part thereof is due for the early cleanup. The first, the ranking medical officer, Colonel T. J. Kirkpatrick, was a man of fiery temper but of keen perception and far vision, a doer of things, appreciative of tasks well performed, condemnatory of others, and, above all, not afraid to ask and demand of higher authority necessary equipment and regulations. Much of the excellent and adequate medical supply, most of which arrived at camp long after his removal, was due to his insistent demands. The second, an admirable assistant, more quiet but none the less persistent, a digger and stickler for the buried and unknown (not always fly larvæ in manure piles either), Lieutenant Colonel E. F. Geddings. His work in cleaning up the milk and ice cream, in ferreting out manure piles and larval breeding points, in closing springs and pumps openly available to the soldiers, and his care of the camp dump stand out preeminently.

The third officer was our beloved Colonel Henry Page. No tribute which I am able to write could recompense this gentleman. When I say that the large group of medical officers who attended Camp Greenleaf have him to thank for a safe abode, from the viewpoint of health, I am sure that they will agree with me to a man, no matter how much they disliked the picking up of cigarette stumps. When we first arrived, the flies were so thick that eating became only a matter of necessity and the main issue at the meal centred around attempts to beat the flies to it. It was necessary to fight them from every mouthful that as few of them as possible might be eaten. This was of special interest since the latrines, that mecca of flies, with one exception, a McCall incinerator, were only a few yards distant and a creek conveying the effluent of a much overchoked septic tank not much further. The efforts of Colonel Page were rewarded to such an extent that the fly, while not exactly a rare specimen, might be said to have been exterminated by the end of August. This result was brought about by the swatting, killing, poisoning, trapping, sticking, screening and cleaning up in general. I am sure that if everyone learned to hate the fly and to kill it. for one reason, as I did at this camp, this family of the Diptera would belong to the past and specimens occupy a niche in our museums among the valuable and rare collections.

There were many other officers whose early intelligent and conscientious work was highly commendable and to each and every one a proper share of the cleanup credit is due.

The extermination of the adult fly was accomplished as much by trapping as by anything else. A special trap devised by Lieutenant Ober, using near beer as bait and placing it in the favorite habitat of the flies, worked wonders. The real work was accomplished at the source and that was the ferreting out and destruction of breeding places. All manure was daily carried to a railroad siding and hauled away. All garbage was either incinerated or carried away. Garbage pails were cleaned out, lids kept tight, and surroundings whitewashed. All old manure piles or other breeding places were hunted up and either buried or removed. There was one large dump, everything brought there was incinerated, and over the fillin the top was covered with a layer of dirt and sowed with hay sweepings. As a result green fields sprang up over and behind the dump and the fly as well as odor and other filth conquered. All dirty stable floors, corrals and picket lines were soaked with crude petroleum. This was partially worked out by experiment in tin cans in the laboratory until the proper amount of oil for this soil could be approximated. It was found to be an excellent larvicide, penetrating to several inches, where even in dilution it remained adequate. This constitutes the second step in the cleanup.

Attention was next directed to miscellaneous water supplies. It was found that there were a number of pumps tapping surface waters scattered throughout the park and in the extra cantonment zone several large springs available to the troops. Among the latter were two or three springs flowing several thousand gallons daily of clear, cool, innocent looking water. These formed the sole supply for the neighboring inhabitants. Many samples taken from every available source of this miscellaneous group were found to contain Bacillus coli in quantity, with the single exception of several springs at Catoosa. In the park the pumps were removed and the wells promptly closed. Several wells in the immediate vicinity were placarded and one, which was notorious, was closed with barbed wire. This completed the care of water supply and may be said to be the third step.

In this country there has occurred a peculiar condition known as sink holes. These are large caveins, some of which are a hundred feet in diameter, filled with water, and said to be bottomless. The strata are lime formations and there is a common opinion that an underground river flows through here connecting all deep wells and springs. This could not be proved, but would easily explain the generalized pollution of all waters. There was one large sink hole behind one of the deep wells used as a local supply. About thirty grams of fluorescin was placed in this and the well watched for days, but no connection could be traced.

The fourth step was the milk supply. Conditions in this field were abominable. The supply was from two general sources, large dealers from the city of Chattanooga and small farmers from the surrounding country. Unsurmountable difficulties were met with both from within and from without and this supply was never what it should have been, but in the course of time was generally improved. At first fifty thousand bacteria to the c. c. for milk and one million bacteria to the c. c. for ice cream, with small quantities of gas production allowable, but free from Bacillus coli on Endo plates, was taken as a standard. The milk was not to be watered and to be free from preservatives. Some milk supplies were found to contain several hundred thousand bacteria to the c. c. and to have a heavy colon growth, some was found watered to the limit, and some supplies were loaded with formaldehyde. To get a sufficient supply clean and safe seemed impossible. The only clear solution to the problem was to establish a central pasteurization plant. This was recommended on August 30, 1917, and again on September 10, 1917, by a typhoid board, of which I was a member, but was never carried out and is to be considered as one of the failures. In its place many inspections were made. Attempts to clear up and educate at the source brought little result, so that many of the smaller dealers were closed up entirely. One of the larger dealers pasteurized his milk faithfully and then put it through a bottler found to contain flies, and into bottles which were far from being clean. One dealer supplied a non-pasteurized milk throughout the entire encampment, which was badly contaminated and at times so much watered that he deducted several hundred dollars from his month's bill to make up for the water. The officer responsible merely commented that that was the best supply he could get and he would have to have it regardless. This was probably true, but a pasteurizing plant at a nominal cost could have settled the whole problem.

Ice cream was obtained mostly from Chattanooga with a small amount from Knoxville, Tenn. This constantly ran a high count, several million bacteria to the c. c. An epidemic of typhoid fever, one hundred and twenty cases with eleven deaths, or two and five tenths to three times that of previous normal years, occurred in the city of Chattanooga in August, 1917, and was traced directly to the ice cream of a particular dealer by Dr. Lumsden, of the United States Public Health Service. For a time all ice cream was shut off from the post. Honest effort on the part of the dealers improved this, and while not up to the standard the supply was greatly improved. Late in September, 1917, the United States Public Health Service established an extra cantonment zone under the able leadership of Dr. C. P. Knight, passed assistant surgeon. The earlier work of inspection by the medical department was amply enlarged by this officer and his efficient staff during the latter months. Much credit is due the department for its work with the none too well educated civilian population.

A great part of the camp, but not all, drained its sewage into an old septic tank. This soon became flooded and necessitated its complete abandonment. Raw sewage, for a time, passed down the Chickamauga creek. A new set of septic tanks was built and completed. This part of the work the writer had nothing to do with, but is able to state that considerable was done and the plant eventually proved quite adequate and satisfactory. Many types of latrines were used at different times. This is an excellent means of disposal, when carefully built, kept clean with hypochlorite of lime or crude petroleum and filled in before overflowing. Where there are large numbers of men too much space is required for their continued use. In some instances the expansion of camp necessitated building over ground which was originally filled with latrines. This might possibly become a dangerous source of contagion.

Attention was next directed to the soft drinks. These beverages were put up by many firms, made in various ways, and usually bottled. They were consumed in huge quantities. Inspection of some of the plants brought out many defects which were corrected to a certain extent. Laboratory examination of samples of these drinks, while not extensive, was sufficient to furnish some data. It was found that all samples examined were free from gas production and Bacillus coli. They were often not sterile, showing a variegated flora and one sample contained several water bugs. The soft drinks were probably not up to a perfect standard, but they were free from Bacillus coli and as such were considered safe from a typhoid standpoint.

In searching out less likely sources of contamination, many samples of canned foods, fresh foods, artificial ice, syrups, specimens of soil and other things were studied. No sensational results were obtained and attention was never focused to any great extent along these lines. The food handlers offered a great problem from the viewpoint of carriers. I did a considerable amount of this work, but large numbers of cooks and waiters were examined under the control of other officers. As far as is known, no positive cases were encountered. This phase of the subject in a large gathering of men is a most important one and too much emphasis cannot be given it. However, the technical difficulties are tremendous in a large camp with a continually changing population. Where cooks, bakers, waiters, and others are few in number and do not change rapidly, such examination should always be made.

In the consideration of the general methods taken to prevent typhoid fever I have left out to this point what must be looked upon as the most important single measure—antityphoid vaccination. It will be taken up here merely as a statement of fact and resumed in the final discussion. Every man coming under the direct supervision of the army was vaccinated against typhoid fever by the subcutaneous injection, in three doses seven days apart, of a vaccine made from killed cultures of Bacillus typhosus prepared at the Army Medical School in Washington. This rule was strictly adhered to and only by the cleverest subterfuges or by gross disobedience of orders was anybody, from buck private to general, allowed to escape. Later, as it was recognized that Bacillus paratyphoid A, and particularly B, were prevalent on the other side, these organisms were added as a triple vaccine. Probably the majority of the men in the service received this form of vaccine. Still later the vaccine was prepared by suspension in an oily base, the dose increased, and the whole amount given at one time. It is not my intention to go into detail with regard to the relative merits of the different forms of vaccine, but to consider vaccination as a whole with reference to its prophylactic value.

The study of the incidence of occurrence and the handling of all cases of typhoid fever during 1917 is an interesting one. The cases were divided into two groups; first, typhoid fever positive where clinical symptoms were present, Bacillus typhosus isolated in pure culture from the blood, urine, or feces, and second, clinical typhoid fever, where Bacillus typhosus was never isolated but the clinical course was typical. Blood agglutination was not carried out routinely because of the influence of vaccination. A typhoid board was created locally at the post hospital and all cases of continued fever not otherwise accounted for came under its observation. This board consisted of Major George A. Traylor, later Major Charles Smith, Captain J. B. Blevins, and myself. The clinical members of the board did yeoman service and by their careful observations we feel sure that every case came under consideration. The laboratory work was performed at the Army Medical School, the laboratory of the Southeastern Department, Atlanta, Ga., and at our own laboratory. In this way the cases had a triple check since the same case was worked on from three different laboratories. Many cases presented difficulties in diagnosis and while many were excluded, it is felt that not a single positive case failed to be recognized. The board met daily and made such recommendations as were advisable. Where difficulties were encountered in having regulations properly carried out, the same were put in writing, passed through proper channels, and in every instance they were promptly attended to. The patients were isolated at first in a small ward as fast as they were recognized. Many patients reported for sick call and were sent to the hospital almost on their first days of illness. This made early diagnosis a little delayed but offered an excellent and accurate chance for study. Later when the epidemic among war prisoners broke out, a larger ward was obtained and isolation was more complete.

After many changes, necessary to meet local conditions, the following rather ideal condition prevailed. All patients were in a separate building. All nurses and attendants wore caps and gowns or changed their clothing. All food was brought to the outside of the building and served in utensils which never left the building. The ward was carefully screened. An outdoor incinerator and stove to boil water in large galvanized iron cans was constructed and here fires were kept constantly going and water constantly boiling. All linen taken from the building was boiled for at least half an hour, hung out to dry, and then sent to the laundry. All urine and feces were dumped into one galvanized iron can and boiled. (It must be remembered that the sewage disposal plant draining this unit was out of commission.) The solid residue was then consumed in the fire. The bed pans and urinals made of agate were then boiled for one half hour, washed and returned to the ward. Chemical sterilization, using hypochlorite of lime, was given a thorough tryout both as a disinfectant for feces and to sterilize utensils, but after prolonged contact even in concentrated solutions, Bacillus coli could easily be recovered. This result, together with the uncertainty of the human factor, led to the use of the incinerator, which was found entirely adequate after men were trained to run it in the proper way. The method worked so well that it was adopted by other officers for the sterilization of linen from all contagious cases and was used throughout the winter after all typhoid had subsided.

The occurrence of typhoid fever among the United States troops, was as follows: There were in all twenty-one cases of typhoid fever during 1917 among troops of the United States Army at this camp. In five cases there were positive blood findings, in one case, in an officer's child, there was positive blood agglutination to Bacillus typhosus, and in fifteen cases there was clinical typhoid fever without positive laboratory findings. The positive cases were all fairly severe, the longest duration ninety days, a perforation in which recovery took place following operation, the average being seventy-two days.

In the five cases which gave positive blood findings, the first patient, G. Y., had not completed prophylaxis, receiving only two doses by June 3, 1917, when a second series was started on June 19, 1917. He was first taken ill on June 12, 1917. The second patient, G. G., completed prophylaxis on July 16, 1917, and was taken ill on July 20, 1917. The third patient completed prophylaxis on May 4, 1917, and was taken ill on July 25, 1917. The fourth patient completed prophylaxis on September 9, 1915, and was taken ill on August 5, 1917. In the fifth case, second dose was given only on October 2, 1917, and the patient was taken ill on September 26, 1917.

In comparing date of onset, with date of arrival at Fort Oglethorpe, it will be seen that the first two cases were probably and the last undoubtedly imported, while the third and fourth were local infections. One can only conjecture as to the source of infection in these two cases. Ice cream seems to have been the probable source, since both patients had partaken of the same dealer's cream at the time it was responsible for the Chattanooga outbreak.

From a study of the clinical cases, it will be noted that seven patients out of fifteen were either incompletely vaccinated or vaccination was completed immediately before the date of onset. In the remaining cases the patients were vaccinated at least a month before the onset of the disease. These, added to the one positive case, make nine cases of typhoid fever all told in successfully vaccinated individuals. These figures may be appreciated more thoroughly when considered with the constantly changing population, a daily averaging census of thirty thousand and probably well over one hundred thousand men passing through the camp during the time under consideration.

While there was not a single death among the troops, the disability in number of days on sick list, the length of time for complete convalescence after discharge from the hospital, the development of tuberculosis, the complete loss of the services of two men in training for officers, and one or two men discharged on S. C. D., will suffice to recall the economic importance of these results to the effectual units of the army.

There were twenty-two cases of typhoid fever in the form of an epidemic among the war prisoners. Thirteen of these gave positive cultures or positive agglutination of Bacillus typhosus and nine did not. All were typically clinical typhoid and most of the cases were severe. There was one death, and the autopsy revealed all the typical pathology of the disease with a severe grade of toxemia and without perforation or hemorrhage. Ten patients had never received any prophylaxis, seven had been vaccinated in 1915 on ship board off the China coast, and five had been vaccinated within a month of the onset of the disease. The efficacy of vaccination in this epidemic is again clearly shown. It would seem that the immunity does not continue over a period of two years and that within a month it is not sufficiently developed to establish complete protection.

On orders from the War Department a typhoid board was created consisting of Colonel Roger Brooke, Major George A. Traylor, and myself for the purpose of investigating this epidemic. A rather comprehensive and complete study was carried out. It would seem an easy task to find the source of infection when the movements of all members together with their food supply could be so definitely traced as in a prison camp. Deductions were arrived at more from negative results than positive findings. The first case occurred on August 20, 1917, with the apex around August 24th and eighteen cases had occurred by September 1st. This would give the probable source of infection between August 10th and 15th. Most of the patients were from one barracks using one mess hall. No milk or ice cream was served. The food was obtained from the quartermaster and was the same served the rest of the camp. All cooks and waiters, about ninety, were examined for carriers twice and proved negative. Utensils, cans, unused and opened foods were negative. This narrowed the infection to two probable sources. One was a package of homemade cheese sent in by a friend and another a box of sweet chocolate from a dealer, on whose farms typhoid had been known to occur. The men had partaken of both of these foods but neither of them had remained for examination. In view of all negative local evidence, the confinement of the epidemic to one mess, its origin from one apparent infection, and its complete control as soon as this source was gotten rid of, the conclusion was drawn that it was due to the cheese. Efforts to get the local board of health in the city from whence the cheese was shipped to report on the place failed to bring results, so that definite data could not be obtained.

Chickamauga Park, Georgia, has been made famous on several occasions but never more infamous than in connection with its typhoid fever outbreak at the time of the Spanish-American War. During 1917, troops were again to be concentrated at this point, and while considerable reliance was placed on antityphoid vaccination, it was not a proven procedure peradventure of a doubt.

Upon earliest investigation of general conditions, everything favorable to the propagation and spread of the bacillus of typhoid was found operative. The water supply was contaminated with Bacillus coli, the milk and ice cream were filthy, bacterial laden, watered, and preserved with formaldehyde. The flies were present by the millions with breeding places on every hand. The climate was warm and moist and above all, cases of typhoid fever, almost epidemic in nature, were present among the neighboring civilian population. Balanced against this state of affairs there was operative a rapidly filling camp with men from all over the country and vaccination, which had been tried, found to have wonderful possibilities, but still on the mat. With this, the first case of typhoid began early and those in charge found a problem on their hands. Earnest effort resulted in potable water, better, if not the best, milk and ice cream, the closing of contaminated wells and springs, thorough and frequent inspections of cattle, barns, milkhouses, milk plants, water sources, sewerage plants and effluent creeks. Above all, as thorough vaccination of all men as the rapidly changing movements would allow. The fly was attacked as conscientiously as the training of soldiers and, I cannot repeat too often, conquered. These were the methods used to back up and reinforce what was hoped for, that is, complete protection from vaccination.

In spite of all these means a few cases of typhoid fever occurred, but they were so scattered and so few that they became a negligible factor in the impediment to the machine as a whole. When these cases did begin, they were isolated and treated so that I doubt whether a single infection could have gotten away from its confines. An imported epidemic occurred among the war prisoners which was promptly controlled and out of the whole number only one death resulted. This study constitutes the cases which arose during 1917. During 1918, there were also a few scattered cases but these were not even considered important enough to comment on, since by that time protective prophylaxis with other cleanup methods were no longer on the mat, but had been tried and found to be all that could be desired.

It is not my intention to discuss all the phases of this subject but several points stand out distinctly and deserve more profound thought. In the first place, at this writing after everything is over, little interest is shown in typhoid fever. It is a true philosophy that we soon put aside old truths and take for granted conditions that are really remarkable with the thought that they were well accomplished and, being an every day condition, they must have always existed as such. Typhoid fever has been conquered as far as the scientific medical world is concerned, but has it been eliminated? In 1898, while not in complete ignorance, advantage was not taken of what knowledge had been gained. In 1907, what a different story! The civilian population was somewhat better posted but not much, depending almost entirely upon what protection a chlorinated water supply gave them. On the other hand, the Army could and did take advantage of the knowledge of the disease, its etiological factors, its mode of transmission, the methods of combat, including direct vaccination prophylaxis. What were the results? A mobilization of over a hundred thousand men and only one true case of typhoid fever in a successfully vaccinated individual. This is the monument to which I wish to call attention, not only to commemorate those earlier earnest workers of the regular medical department of the Army but the medical profession as a whole. Typhoid fever alone raging in the cantonments during the preparatory training for the World War, as it did in 1898, would have rendered the effectuals as inefficient as any number of intense gas attacks the Germans might have invented or any number of transports they might have sunk after those men were on the firing line.

The subject of typhoid fever is one that elicited small interest during the war by its absence. It is this absence that should be brought home to us at the present time.

Esophagoscopy*

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Esophagoscopy is a much older art than one might at first believe. Bozini was the first to attempt the illumination of cavities of the human body, and he described his apparatus for this purpose in 1795. In 1807 he examined the upper end of the esophagus. In 1860 Voltolini demonstrated what he believed to be the first practical tracheoscope before a medical congress in Berlin. In 1868 Kussmaul, using an elongated urethroscope, diagnosed carcinoma of the esophagus. Other workers, such as Trouvé in 1873, Mikulicz in 1881, Gottstein, Von Acker, Kirstein and Killian in 1897, and Jackson in 1904, helped considerably to place endoscopy on a firmer basis.

In 1895 Pieniazek is reported to have removed a small bone through his tracheal speculum. In the same year Kirstein performed a direct laryngoscopy and bronchoscopy. He met with success in twenty-five per cent. of his cases and partial success in fifty per cent. He felt that only a limited number of patients were fit subjects, and that entering the trachea was a dangerous procedure. Killian followed closely upon Kirstein's first work, and in 1897 he removed a piece of bone from the right main bronchus of a man aged sixty-three years. Killian was convinced that the thick, resistant walls of the larger bronchi could be entered with comparative ease and safety. The bronchi are elastic and yield readily to pressure so that the entire tube under inspection can be displaced, bringing its lumen into a single plane for observation.

With the evolution of the technic has come the evolution of a suitable instrumentarium. The first instruments of Kirstein and Killian were rather crude. Bruning, in 1907, improved upon them considerably. The first esophageal tubes were of the design of Rosenheim. Illumination was developed simultaneously with the other phases. In America, Jackson published the first comprehensive work in 1907. Until recent years bronchoscopy and esophagoscopy have been resorted to for foreign body removal almost exclusively. Through the publicity that has been given the good work of some of the best endoscopists, the internist particularly has learned to call upon this branch of our specialty. Such diseases as asthma, syphilis, malignancy, erysipelas, diphtheria, lung abscess, and bronchiectasis, stenosis, and unsuspected foreign bodies, have been noted in the tracheobronchial tree. In the esophagus we have on record the following conditions, studied and observed endoscopically: Acute esophagitis, carcinoma, syphilis, typhoid and tuberculous ulceration, varicosities, angioneurotic edema, diverticula, cardiospasm and hysterical tumor.

It is hoped that the following series of tube cases will be of interest. All of these except two of the foreign body cases, were seen in the laryngological service at the Kings County Hospital within the past year. Unfortunately, röntgenological diagnosis and confirmation could not be obtained in some of these cases, for the x ray room was closed before the time of admission to the hospital.

Foreign bodies in the esophagus are, as a rule, easy of removal; the facility of removal is decreased in proportion to the duration of the sojourn, and the amount of manipulation and attempted extraction the given case has been subjected to. The larger the foreign body which is lodged bronchially or esophageally, the more likelihood there is of local tissue changes. These may be slight and negligible, or extensive and severe, and a serious menace to life according to the nature of the intruder, the point and the duration of lodgment. Digital efforts at removal, unsuccessful attempts which consist usually of blind stabs with a curved grasping forceps or the use of a probang, bougie, or stomach tube to force the intruder down, increase both the local and general morbidity and may well designate the borderline between life and death in a given case.

In one of the cases where the intruder had lodged high up in the esophagus, although the child escaped serious injury, his posterior laryngopharyngeal wall was badly lacerated and presented an unsightly picture, due to several unsuccesful attempts at extraction before the patient was seen. The administration of castor oil is of no value and may prove harmful. Foreign bodies in the esophagus which are not pointed and not so constructed as to be likely to be impacted will pass through without serious complication. On the other hand, a tack or screw or open safety pin, in fact any pointed object if it has worked its way down to the intestinal tract, will be more prone to impaction and perforation by the increated peristalsis which a cathartic induces.

Three of the foreign bodies here reported were not recovered. Of these one case terminated fatally and the other two bodies passed through the gastrointestinal tract. In the fatal case, the patient with an open safety pin in the esophagus probably died as a result of being carried about too much before the time of extraction. Impaction, perforation, or laceration, creates a grave situation and is a great possibility when the subject is allowed to run about or be actively moved about. Therefore, a patient suspected of having a sharp foreign body should be handled with care and kept in bed.

Case I.—A. A., male, aged nine years, was seen through the courtesy of the surgical service at the St. Catharine's Hospital, August, 1920, where the boy was under treatment for having swallowed a fifty cent piece ten days before. The child complained of discomfort during the sojourn of the foreign body, and could take liquids until twenty-four hours or so before seen. He was now emaciated and had considerable acidosis. The laryngopharyngeal wall posteriorly was quite swollen and edematous. The coin was hidden by the edematous tissue of the esophagus which closed around it. No anesthesia was used. The coin was removed with the aid of an upper esophageal speculum and universal grasping forceps. A tampon saturated with argyrol solution was placed in the area of lodgment and left there for a few minutes. The boy had no untoward symptoms as a result of the long sojourn of so large a foreign body.

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*Read before the Brooklyn Medical Association, February 8, 1922. (From the Department of Laryngology, Kings County Hospital.)

CASE II.—G. S., male, aged two months, was brought into the Kings County Hospital on the ambulance. An overall button had been forced down his throat by an older baby brother. The foreign body was lodged between the vocal cords and slid along them with the motion of the child's head. Forward motion would cause a corking of the glottis and suffocation. No anesthesia was used. The foreign body dropped into the pharynx upon introduction of a laryngeal speculum. The patient was seen six hours after the mishap.

CASE III.—H. F., male, aged twenty-three years, was showing a little boy the trick of inserting a penny into his nose and withdrawing it from the mouth. He thrust it too far back and it became impacted in the upper esophagus in the plica cricopharyngeus from which it was readily extracted. No anesthesia was used. The patient was seen three hours after the introduction of the foreign body.

CASE IV.—P. P., male, aged thirty-eight years, was referred to the hospital by his family physician. He had swallowed a roast pork bone, and it had become impacted at the level of the clavicle. The patient complained of pain and inability to swallow. Cocaine anesthesia was used. Esophagoscopy revealed an abrasion of the mucous membrane of the esophagus just below the cricopharyngeus muscle, and a small piece of bone was seen in the stomach. It was considered inexpedient and unnecessary to remove the intruder because removal would have lacerated the esophagus and the bone was not so large that it could not be digested and taken care of by the gastrointestinal tract. He was seen eight hours after the entrance of the foreign body.

CASE V.—E. J. McK., male, aged sixty-one years, was eating pork chops the evening before and felt something stick in the region of the upper esophagus. He could not swallow anything. Indirect examination with a mirror showed a total occlusion of both pyriform sinuses with slight forward pressure upon the arytenoid cartilages interfering slightly with phonation. Respiration was not embarrassed. The foreign body was removed with difficulty because the decomposed meat allowed the grasping forceps to pull right through. The intruder had some cartilage, but it consisted mostly of meat. The patient was seen fifteen hours after the introduction of the foreign body. No anesthesia was used.

CASE VI.—E. L., female, aged seven years, went to the store with her sister and in the course of an argument as to who should carry the money, swallowed a twenty-five cent piece. She was seen five days after the quarter went down. The coin was surrounded with considerable food detritus and congested esophageal wall. It was therefore not readily accessible. It was impacted in the plica cricopharyngeus from where it was removed with the aid of the esophageal speculum and special grasping forceps. No anesthesia was used.

CASE VII.—D. B., female, aged twelve months, came into the hospital with a history of having snatched an open safety pin from the mother's apron and of having swallowed it. She was presented for esophagoscopy some eight hours after the mishap. A röntgenogram showed the safety pin open, point upward, in the upper esophagus. The child was kept on the table for twenty minutes; both esophagus and tracheobronchial tree were explored, but the intruder was not found. Later röntgen study showed the pin in the stomach. The child died the following day of bronchopneumonia. The pin was not recovered. Esophagoscopy was first attempted without anesthesia, but because of the child's struggle, ether anesthesia was resorted to. It is very probable that the struggle prior to anesthesia and during the stage of excitement was responsible for the passage further down of the intruder.

CASE VIII.—M. D., female, aged eighteen years, came to the hospital thirty-six hours after having swallowed a pin while picking her teeth with it. At first she felt it lodge in the pharynx, where it caused pain and coughing. When first admitted to the hospital x ray and fluoroscopy showed the pin at the level of the arytenoids. The patient was fretful and nervous and was allowed to walk around a great deal. The result was that just before attempted extraction the fluoroscope showed the pin in the upper esophagus. An esophagoscopy was performed and the pin could not be found. Fluoroscopy did not disclose it either. In this case esophagoscopy was attempted with no anesthesia, but as the patient would not relax and cooperate, ether was used. The pin was probably lost during the early stage of anesthesia. Six months later it was reported that the patient had had no untoward symptoms and that there was no certainty that the pin had passed through.

CASE IX.—S. S., female, aged thirty-nine years, came to the hospital complaining of loss of weight and inability to swallow anything. She was sure of the presence of a tumor which she localized below the clavicle. Esophagoscopy demonstrated an unobstructed lumen with apparently normal, healthy mucosa throughout. The diagnosis of hysteria was thus confirmed. The patient was strongly impressed by the tube passage and swallowed after having been esophagoscoped once. Cocaine anesthesia was used so that the patient received the psychic benefit of the procedure.

LUNG ABSCESS AND BRONCHOSCOPIC IRRIGATION.

The following three cases of lung abscess are of particular interest. They demonstrate the value of bronchoscopic irrigation in this type of case; two of them are cases that immediately followed tonsillectomy with general anesthesia:

CASE X.—F. N., a girl of five years, was referred for bronchoscopic examination and irrigation by a pediatrist, in June, 1921. Her history was as follows: She had been coughing since the age of ten months when she had pneumonia, and had been expectorating as much as a cupful and more of pus in twenty-four hours just prior to being sent for bronchoscopy. She had pyelitis at about the same time as her cough first began. There was no history of a foreign body. Physical examination showed definite impairment of resonance over the left base posteriorly with some impairment of resonance and breath sounds over the entire left chest. Coarse râles and tubular breathing could be made out over the left base. Several months before a provisional diagnosis of unresolved pneumonia had been made. Repeated Von Pirquet and intradermic tests were negative. The x ray study showed an indefinite shadow in the left lower lobe obliterating the border of the diaphragm on that side. There was no distinct limiting boundary as is usually seen in pictures of an abscess. The right lung was slightly expanded so that the heart was displaced definitely to the left. Bronchoscopic study showed pus coming from the left lower lobe bronchus. After the pus was evacuated by suction there was no evidence of a foreign body or of a stenosis or a dilatation of the bronchus examined. The presence of a stenosed bronchus would confirm the diagnosis of bronchiectasis. This would be the logical conclusion from the lack of a true abscess picture in the röntgenogram. It does not seem justifiable to differentiate in this case between abscess and bronchiectasis though one might be inclined more strongly toward the former, because of the later behavior of this case.

This patient was bronchoscoped and her abscess cavity irrigated twice at an interval of a week. After the first irrigation she expectorated only occasionally and much less than before. After the second irrigation she did not expectorate any pus and only coughed occasionally. At the time of her second irrigation the stethoscope showed an almost immediate aeration of the lower left lobe while the bronchoscope was in place. A röntgenogram taken two months after the second irrigation showed a clear, left, lower lobe, with the heart replaced in its normal position and evidence in the involved area of a slight fibrosis. The diaphragmatic shadow could be plainly discerned. She practically expectorated no pus and only coughed occasionally until almost six months later, when she began to cough and expectorate as frequently as every few minutes. This followed upon a socalled cold according to the story of the mother. This recurrence was rather a disappointment, as she was thought to have obtained a true recovery. She was again treated, and when last seen was expectorating only six or seven times a day, as compared with every five or six minutes before. This case strongly demonstrates the advantage of bronchoscopic irrigation. These irrigations have helped keep this child in fairly good health and have improved her general condition.

CASE XI.—M. H., female, aged thirty years, was originally referred by the medical service. She had a tonsillectomy performed in one of the larger hospitals in New York. During the profound general anesthesia her throat was subjected to a good deal of manipulation, and, from her history it appeared that several hours had elapsed before she had regained consciousness from the anesthesia. She did not feel well immediately after operation and went to bed at once upon her return home from the hospital the day following tonsillectomy. One week later she began vomiting, coughing, and expectorating pus. At the height of her trouble she expectorated as much as eight ounces a day, and coughed and expectorated every few minutes. Her physical signs when seen were the following:

Percussion note was decidedly dull at the right base posteriorly. Breath sounds were increased throughout the left side. The breath sounds over the right lower lobe were almost entirely suppressed. The voice sounds were impaired, also fremitus. Anteriorly, in the axillary line, there was relative dullness with suppression of voice and breath sounds on the right side. A diagnosis was made of lung abscess involving the right lower lobe. Bronchoscopic irrigations have kept her expectorating a small amount only a few times a day. She has gained weight and feels much better than before the bronchoscopic irrigations were instituted.

CASE XII.—G. D., female, aged fourteen years, who was referred to the service from the Brooklyn Home for Consumptives, was a pathetic and very instructive case. She had tonsillectomy performed at one of the smaller hospitals in Brooklyn. According to her own statement, her admission temperature was 102° F. She was nevertheless operated upon, and it appears from her history that several hours had elapsed before she regained consciousness from the anesthesia. A few days later she began coughing and expectorating a foul, blood tinged sputum. She was examined by physicians who declared her tuberculous and had her sent to the Brooklyn Home for Consumptives. The doctor at this institution could not confirm the diagnosis of tuberculosis of the lung, and it was decided after a careful study that she had two lung abscesses. X ray study reveals two abscesses of fair size in the right upper lobe. At the time of admission for irrigation she was expectorating more than six ounces of foul, blood stained fluid in twenty-four hours. After her first irrigation her expectoration decreased somewhat, and the frequency of every three or four minutes was extended to every forty-five or fifty minutes. She is feeling much better and eats and sleeps well as compared to the time prior to bronchoscopic treatment. At present she expectorates but a few times a day and coughs only occasionally.

The late Dr. Lynah, who did considerable work in bronchoscopic irrigation, believed that conservative bronchoscopic measures of treatment should be given a fair trial before radical surgery, some of which was quite deforming, was attempted.

The accepted treatment of lung abscess is drainage. The structure of the lung parenchymal space opening into the bronchial tree is such as to provide drainage where an abscess communicates with a bronchus. Early, spontaneous evacuation frequently means a cure of the abscess. The spontaneous evacuation of such a process is dependent on several factors. Principal among these there is the integrity of the expulsion apparatus of the chest. This consists not only of the tracheobronchial mucosa and musculature, but also that part of the musculature of the thorax which can compress the lungs and help in the expiratory or expulsive effort. The function of this latter factor is enhanced, of course, by the patient's good, general, physical condition. Now, if the patient is weak and debilitated, and too tired to force the abscess content out of the chest, the danger of spread, absorption, and interference with the function of the healthy surrounding lung is increased. Another factor and a very important one is the consistency of the abscess exudate. If it is very thick and tenacious, there is less likelihood of expulsion even though the patient has a strong expulsive force. If an abscess cavity does not evacuate and cure spontaneously, as some of the smaller ones occasionally do, the patient carries a constant menace to the surrounding healthy lung structure. This is the explanation of some cases in which there is more than one abscess. Hedbom, of the Mayo Clinic, states that the mortality in cases treated expectantly is seventy to ninety per cent.

TYPES OF TREATMENT.

In the treatment of lung abscess there are two types, conservative and radical. The conservative treatment consists of either the expectant plan with no local interference as far as the abscess itself is concerned or of bronchoscopic irrigation. Radical treatment consists of surgical procedures such as the production of a pneumothorax as advocated by Tewksbury, or lobectomy, which is the removal of the diseased lobe in its entirety; or the use of the cautery to eradicate the abscess cavity.

The employment of the bronchoscope and irrigation suction apparatus in cases of lung suppuration, offers considerable definite relief to these sufferers. Irrigation thins out and evacuates a secretion in some cases that frequently could not be removed by the patient's own efforts. The secretion which later accumulates is softer and looser and is therefore more readily expelled. The expectoration and frequency of the cough is very markedly decreased as a result of irrigation and the spread of the pathologic process is held in check.

The patients gain weight and feel better as a result of this form of treatment. If seen early enough we can hope for a recovery in some of these cases.

Lynah reported several cures in his series. When an abscess has lasted a long time and cannot be helped by bronchoscopy, the thoracic surgeon should be called in.

I wish to thank Dr. Cameron for permission to report such of the cases as occurred in his service. I also wish to express my deep sense of gratitude and obligation to Dr. Arrowsmith, who is responsible for my special interest in bronchoscopy and esophagoscopy, and to thank him for his teachings, suggestions, and guidance in this work.

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Labyrinthine Surgery*

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The problem presented by an infected labyrinth, when it should be operated upon and the method of election, is still an exceedingly interesting as well as a very difficult one. The number of cases requiring operation is so small that even in the large clinics the opportunities for observing and operating in them are rare and the statistics very limited. One fact that seems well established is that at one period in the past there were too many labyrinth operations performed, the mortality was entirely too high, so that at the present time we are inclined to be much more conservative and to view the surgical invasion of the labyrinth as a grave undertaking, especially where it is indicated in the presence of an active infection. In a consideration of the subject, the fact must be constantly borne in mind that if the infection could be limited to the labyrinth there would be little danger and it is not a labyrinthitis but a meningitis that is responsible for the mortality. The problem then resolves itself into the determination as to whether an operation in the individual case will limit or prevent an intracranial extension of the labyrinthine infection. While the actual space contained in the labyrinth, consisting of the semicircular canals, the vestibule and the cochlea, is very small, its intimate relation to the meninges renders any bacterial invasion a dangerous one. Removal of the stapes makes an opening directly into the vestibule and the perilymph, communicating directly with the spinal fluid through the aqueduct of cochlea while the opening of the cochlea and the destruction of the modiolus lead into the endolymph and into the arachnoid space. Considering these facts, it is hard to see why any infection in these spaces does not immediately lead to a diffuse meningitis, but it has been definitely proved that many of them do become localized and the meninges are successfully walled off. This leaves the difficult problem of deciding whether a labyrinth operation will help or whether the labyrinth should be let alone.

There is no question in my mind that of late years there has been a material reduction in the mortality resulting from labyrinthitis, due in part to the fact that in certain cases operation has not been performed and in part to the method of operating. The two factors that stand out as material aids in this reduction are the improved knowledge of labyrinthine functions and the analysis of the spinal fluid.

Thanks to the invaluable work of Robert Bárány, Isaac H. Jones and others, it is now possible to say very definitely whether or not the labyrinth in part or as a whole is functionating. This will undoubtedly prevent surgical intervention in cases in which in the past operation would have been performed with disastrous results. I performed a radical mastoid operation upon a patient in the clinic a short time ago. The labyrinth had not been examined but there was a report of a dead labyrinth. The radical operation showed no visible labyrinthine necrosis and the labyrinth was not disturbed. Subsequent examination showed a dead cochlea, but an active labyrinth.

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*Read before the Otological Section, New York Academy of Medicine, January, 1922. The discussion appears on page 115 of this issue.

In the general consideration of these cases, it is important to know just what part the temperature plays. I believe that as long as the infection is confined to the labyrinth there will be little or no rise in temperature, and should there be a sudden rise in temperature, it is very likely a warning of the extension of the infection beyond the labyrinth, ruling out, of course, other systemic causes that may be responsible for the temperature elevation.

Analyzing the spinal fluid furnishes the one best method of determining in time to be of some assistance to the patient whether the infection is confined to the labyrinth or whether it has extended to the meninges. This is most important. A normal fluid will not show increased pressure, is clear, has about six to eight lymphocyte cells to the c. mm. reduces Fehling's solution, gives a negative globulin reaction. In a diffuse meningitis, the fluid is cloudy and under pressure the cell count runs into the thousands with a marked increase in the polymorphonuclear cells. It does not reduce Fehling's solution, gives a positive globulin test, and shows bacteria in the fluid. Now let the infection become localized and an increase in the polymorphonuclear cells is shown. The cells increase with the spread of the infection and decrease in proportion as the localization increases. If the infection is taken care of by the resistance, the cells return to normal and the patient recovers. If a diffuse meningitis intervenes, the fluid becomes purulent with free bacteria and the patient dies. Even though the cell count runs into the thousands if there are no bacteria present it shows still some localization and there is a possibility of recovery. My observation is that in spite of an occasional report to the contrary, where bacteria appear in the fluid the patients die.

A case occurring at the New York Eye and Ear Infirmary a short time ago serves as a good illustration. With the operator's permission I present the following report:

Case I.—Male, aged eighteen, had a sudden rise in temperature to 104° following an ethmoid operation. The patient's neck was stiff, Kernig's sign was present, and he was unconscious; fluid was cloudy, cell count 13,000, culture negative. Daily lumbar puncture showed a gradual return to normal, the patient recovered, and left the hospital. The last cell count was 25. Probable diagnosis was meningitis, which was successfully localized or walled off.

The literature contains an occasional report of a case with a diffuse meningitis and free bacteria in the fluid in which the patient recovers, and again a localized meningitis within the head large enough to cause the death of the patient and at the same time have a normal spinal fluid. While both are possible, they are not at all probable. A total white cell count and differential is of considerable value where we are trying to determine the progress of a labyrinthine infection. Should the labyrinth alone be involved, the white count should be normal. An extension of the infection to the meninges causes an increase in the total leucocyte count. This goes up with the spread of the infection. If there is a high temperature, with a high leucocyte and a low polymorphonuclear count, it indicates a good resistance. Should the polymorphonuclear count rise very high with high temperature and cell count, the prognosis is bad.

In order to facilitate the discussion of the different types of labyrinthine infections and the best methods for their relief, we will divide them into three classes, as follows:

Class I: Perilabyrinthine and circumscribed labyrinthine infections.

Class II: Diffuse purulent latent labyrinthitis.

Class III: Diffuse purulent manifest labyrinthitis.

The term serous labyrinthitis has been purposely omitted here since it is supposed to occur with an active labyrinth and would fall under the head of class I, although it must be remembered that at any time one type may be converted into the other.

CLASS I.

Under the head of perilabyrinthine cases are included those in which there is an inflammation around the labyrinthine capsule causing some labyrinthine symptoms but no real infection in the labyrinth itself. These cases show an active labyrinth and usually clear up at once following removal of cause.

Case II.—Female, aged sixty-two, with a history of double otitis media purulenta chronica, accompanied by nausea, vomiting and vertigo, was referred to me with a diagnosis of labyrinthitis. The left ear was dry and the right showed a hard fibrous growth just anterior to the drum membrane, canal completely obstructed, labyrinth active. Removal of the growth showed a large mass of epithelial cells, cerumen, etc., in the middle ear; the removal of this was followed by complete recovery. The labyrinthine symptoms were evidently due to pressure.

The circumscribed infections are usually due to a fistula in the horizontal semicircular canal which may or may not show a positive fistula list. In any event, there is still an active or partially functionating labyrinth. All radical mastoid cases should have the labyrinthine function tested before operation and should the operation show a fistula of the semicircular canal and the labyrinth be active, a thorough radical operation should be done and the fistula let alone. It is now generally agreed that in no case of labyrinthitis showing evidence of remaining function should operation be performed.

Case III.—Male, aged forty-two, a plumber, with a history of right otitis media purulenta chronica of several years' duration, rose suddenly and struck his head on a pipe. This was followed immediately by nausea, vomiting, ataxia and vertigo. The labyrinth was active, the positive fistula test showing fistula in semicircular canal. Radical operation was advised and refused. The labyrinth symptoms quieted down and the patient was in good condition several months later.

Ruttin reports in his book forty-three cases of circumscribed labyrinthitis with partial or complete function present in which the radical operation alone was performed and the patients all recovered.

CLASS II. DIFFUSE PURULENT LATENT LABYRINTHITIS.

In this type there has been labyrinthitis with total destruction of function but no active evidence of infection; in other words, there is a dead labyrinth with no symptoms. A spinal fluid analysis should be done and in the event of a normal fluid one can be reasonably certain of the infection being limited to the labyrinth, the meninges having been successfully walled off by nature. The primary consideration here is that we institute no operative procedure which will interfere with this barrier. This is most important. In the event of a healed middle ear condition, the labyrinth should be let alone. Where there is an infected middle ear and a dead but quiet labyrinth, I believe only the most conservative operative measure should be considered. Either a careful radical mastoid operation should be done, allowing the labyrinth to remain undisturbed, or if a labyrinth operation is decided upon, the method followed by Hinsberg seems to be the rational one. The horizontal should be opened and followed forward to its opening into the vestibule. This opening should be enlarged and a probe then passed under the facial nerve to the vestibule. The promontory should then be carefully removed, care being taken not to get into the second turn of the cochlea. Then the small bridge between the oval and round window removed. This drains the labyrinth into the radical cavity and takes the least chance of disturbing the barrier between the labyrinth and meninges.

I believe that where there is a dead labyrinth with a normal fluid and the radical operation shows no visible necrosis, the labyrinth should be let alone. I am also of the opinion that the Neuman operation is never indicated in this type of infection since there already is a protective barrier present and the route through the posterior fossa into the labyrinth offers far more chance of destroying than it does of protecting it.

CLASS III. DIFFUSE PURULENT MANIFEST LABYRINTHITIS.

It is in this type of labyrinthine infection that the real difficulties are encountered; here there is an active process with the problem of preventing or relieving an intracranial extension of the infection. It is well to remember the fact that not only are the meninges involved but there may be a brain abscess or thrombosis of the lateral sinus as well following an infection in the labyrinth. Either there is a very active labyrinthitis from which we fear meningitis or there is some definite evidence of meningeal involvement.

The first step should be a spinal puncture and in the event of a normal fluid and no temperature, the case should be carefully watched and no operation attempted. Experience has shown that quite a few cases of acute purulent labyrinthitis subside without intracranial complications and a normal fluid and temperature would indicate satisfactory progress in that direction.

Again it has been proved that operation in the acute stage offers less chance than one performed where the process has had a chance to become quiescent. In those cases of acute labyrinthitis followed immediately by a diffuse meningitis in which the patient almost immediately becomes unconscious with a high temperature, double Kernig, stiff neck, fluid cloudy and filled with bacteria, I feel that any operative procedure is useless. This leaves then those cases in which there is some evidence of meningeal involvement either through the symptoms or spinal fluid, but it is not diffuse. There is, therefore, a chance that an operation will help. When and what type of operation shall we perform? An important question here is whether or not there are bacteria in the fluid, and in case there are not, there is always a possibility of recovery as is shown by the ethmoid case reported above.

With bacteria in the fluid, if surgical intervention is decided upon, a complete operation is indicated, including an opening into the internal auditory meatus, either by the Richards or the Neuman method with dural incision in the posterior fossa, realizing at the time that there is little if any hope of recovery. Where there are symptoms of meningitis with no bacteria in the fluid, if under observation the case is progressive, a labyrinth operation by the Richards method seems the rational one, opening the second cochleal whorl if the symptoms and findings indicate it. The dura should be inspected in the posterior fossa. The Richards method seems preferable here because in removing the petrous portion of the temporal bone to get to the internal auditory meatus, the dura is adherent and is very likely to be torn and if there are no bacteria in the fluid, this may in itself cause a diffuse meningitis and the loss of the patient.

Dr. Charles Perkins had a case of acute labyrinthitis at the New York Eye and Ear Infirmary a short time ago in which the cell count in the spinal fluid went to 8,000 with culture of the spinal fluid negative. Still no operation was done and the patient recovered. It would seem that operation was indicated there but none was done and the patient got well. I saw another case in which the cell count in the spinal fluid was 1,200. The spinal puncture showed 500: operation was deferred, diffuse meningitis developed suddenly and the patient died. These cases demonstrate how difficult it is to decide and one may be wrong either way. Generally speaking, a good rule would be to operate if the findings show progression of the infection and further observation if it shows improvement.

Where there is a tendency toward localization of the meningitis, repeated spinal punctures should be done both for diagnostic and therapeutic purposes. The possibility arises here for the puncture allowing the infection to extend to the lumbar region following the removal of the spinal fluid. This seems more theoretical than practical since those cases in which there is a localized infection as a rule show improvement each time the fluid is withdrawn. Where there is an accidental injury to the labyrinth during a mastoid operation, such as injury to the horizontal semicircular canal or removal of the stapes, the best procedure would seem to be to keep the patient under careful observation, performing a secondary labyrinth operation if necessary rather than a labyrinth operation at the time of the injury.

Richards calls attention to the fact that all cases of necrosis of the labyrinth are not necessarily due to an extension from the mastoid or middle ear but may have their primary focus in the labyrinth, probably through the blood or lymphatics. This again emphasizes the importance of a labyrinthine test and spinal fluid analysis, if indicated, prior to operation, so that we may be better guided as to what should be done where the radical operation shows labyrinthine necrosis.

CONCLUSIONS.

Considering the number of ear infections, the labyrinth operation is rarely indicated.

Where there is any labyrinthine function still present, a labyrinth operation is contraindicated.

Where there is a dead labyrinth, no symptoms, and a normal spinal fluid, only the most conservative operation should be attempted .

A spinal fluid analysis with a culture furnishes the most accurate information as to the progress of the infection.

The prognosis in types one and two is good and in type three doubtful.

The problem presented in type three is at present a difficult one and we must bear in mind the possibility of a radical operative procedure, inducing as well as preventing a diffuse meningitis.

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Infection with the Organism of Vincent*

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Infection with the organism of Vincent is now being subjected to intensive study. Physicians know more about the disease than ever before, as a result of experience gathered in the army. Nevertheless, it appears that its recognition and treatment have not yet been generally comprehended in a degree commensurate with public needs. It is the purpose of this paper to summarize the subject briefly and add such personal experience as will be of interest or value, laying particular emphasis upon the occurrence of the infection in the throat, the clinical entity that is known as Vincent's angina.

The use of Vincent's name to designate the organism is, on the basis of priority, improper, for it was described in 1893 by Rauchfuss and in 1894 by Plaut, while Vincent's original contribution did not appear until 1896. To avoid confusion, however, the terms Vincent's organism and Vincent's angina will be retained throughout this paper.

The organism appears in two forms, a long, spindleshaped, slightly curved or straight rod and a spiral. The early observers, including Plaut and Vincent, believed they were dealing with two organisms growing in symbiosis. This thought was held in 1905 when Weaver and Tunnicliff reported their first successful cultivation. In 1913 Krumweide and Pratt published the results of their studies and also concluded that the forms were separate organisms. More recently, however, it has been accepted that the two forms are one and the same organism, and lately it has been concluded that the organism is a leptothrix which, if it be a fact, would explain the pleomorphism.

The rods are long and slender with pointed or occasionally rounded ends, somewhat thicker in the middle. They are frequently slightly bent and sometimes S forms are seen; they vary from six to twelve microns in length. These rods are usually scattered uniformly throughout the smears and present various arrangements, occurring in pairs end to end, forming obtuse angles, in irregular clumps, or arranged radially about a central point, sometimes in groups like the Klebs-Loeffler bacillus. They stain fairly well with methylene blue and aniline gentian violet, but are most clearly demonstrated with carbol fuchsin. With the less active stains, especially in the larger forms, there are frequently areas of varying size and shape which stain very faintly. They do not stain with Gram's method. The question of motility is much debated; I have not been able to demonstrate independent motion.

The spirillæ or spiral forms of the organism are long and delicate with pointed ends presenting five to eight curves and actively motile. They stain uniformly but much less intensely than the rods and in faintly stained specimens may be overlooked. They do not stain with Gram's method but are easily demonstrated with dark field illumination.

Cultivation of this organism, while difficult and uncertain, is not impossible. It is an anaerobe and in growing produces an offensive odor. Tunnicliff has isolated the organism from angina and gingivitis on ascites agar using Wright's anaerobic method. I have been successful in cultivating the organism in a one per cent. peptone broth to which a piece of human brain was added and the media overlaid with liquid petrolatum to exclude oxygen. On the second or third day of incubation the characteristic odor and many active spirillæ were present. The cultures died out rapidly and it was necessary to transplant large amounts to get successful subcultures. In young cultures forty-eight to sixty hours old, the organism is markedly polymorphous, spores are frequent, long chains of bacilli frequently appear, and vacuoles are occasionally seen. In one strain that was cultivated for several generations the fusiform bacilli alone appeared; on transplanting to sheep's blood agar the spirillæ appeared in great numbers.

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Each observer of the cultural characteristics of this organism has something new to note, its habits are most bizarre. Some investigators have, after several generations, been able to cultivate the organism aerobically. I have not been successful in this endeavor. Reckord and Baker in their work at Camp Devens were unable to grow their strains on any media. Larson and Barton in 1913 were successful in isolating the organism from the blood stream in a case shortly before death. My attempts at blood culture in five cases, including one extensively infected high explosive wound of the back, were all unproductive of results.

Infection with this organism is frequently encountered and although it may be said that the throat is the point most commonly attacked it is by no means the only site of the disease. Much early knowledge of the organism came from study of it in connection with the socalled hospital gangrene, a common result of infection of military wounds during the Crimean and Civil wars. Vincent made his original studies on material from such sources while serving with the French Army and later pointed out that the organism derived from these cases of gangrene was identical with the one obtained from certain cases of ulcerative angina.

The glans penis and prepuce are not infrequently attacked, the socalled balanitis gangrenosa, or fourth venereal disease. Recently a case was seen in which about half the prepuce had sloughed away and the necrosing process had extended well into the corona. Noma or gangrenous stomatitis, described by Blumer and McFarland, is another not uncommon lesion caused by this organism.

A search of the literature reveals reports of cases of pelvic peritonitis following endometritis in which this organism was the offender. Two cases of brain abscesses and one case of fatal meningitis have also been reported. Several cases of industrial wounds of the hands have been described. It was occasionally, but not frequently, seen with the Expeditionary Forces, infecting military wounds. Gangrene of the vulva and perineum has been reported and Noguchi has seen an ulcer of the labia due to this organism. The infective process has also involved the mucosa of the respiratory tract producing the physical signs of bronchopneumonia. Recently a case has been described in which there was infection of the external auditory canal with extensive destruction of the external ear and Phillips and Berry have reported a case of widespread stomatitis in a dog caused by this organism. Such infections as those cited are, however, extremely unusual and the physician in general is more deeply concerned with the lesion as it occurs in the throat.

The disease to which attention is now directed has been described under several names, Vincent's angina, ulcerative angina, ulceromembranous angina, angina diphtheroides, angina chancriform, pseudomembranous angina and others. Of all these ulceromembranous angina suggested by Weaver and Tunnicliff in 1905 seems to be the happiest choice although Vincent's angina has so long been used it will probably not be supplanted.

The prevalence of this infection is not well realized. It is a common disease. The fact that it is not made reportable by departments of health, although it must be considered a contagious disease, makes it impossible to present definite figures as to its occurrence. It is, however, frequently encountered by the careful observer. It is mentioned with increasing frequency since the war. Whether this is due to the more intimate knowledge of the condition derived from medicomilitary experience, or whether the disease is more widely disseminated as a result of our mobilization, it is difficult to say, both factors probably entering into the increasing amount of consideration that the disease is now receiving.

There is little to be said regarding its especial geographical distribution; it seems to be a universal disease. The Japanese have studied the subject, it is mentioned from India, Central European literature contains much concerning it, it receives the present day consideration of the foremost Italian pediatrists, and a most comprehensive review of the clinical aspects of the disease has recently come from a Norwegian clinic.

The majority of cases have been in young adults from eighteen to twenty-five years of age, although one observer has reported cases in children from twenty-six months to thirteen years. In the series of twenty-seven cases here reviewed, which excludes an unnumbered group encountered during military service and for which data are incomplete, the youngest was fourteen years, the eldest thirty-two.

Males appear to be more frequently affected than females, but this may be due to the fact that many of the groups studied have been soldiers. In my series there were twenty-five males and two females. In the group reported by Weaver and Tunnicliff females predominated.

The use of tobacco, trauma of the mucous membrane—as after tonsillectomy—eruption of wisdom teeth, defective teeth or those covered with tartar, alveolar abscesses, scorbutic gums, syphilis, and mercurial stomatitis, are said to be predisposing causes and it is said to follow infectious diseases such as measles, scarlet fever and whooping cough.

In the cases in the present series there is little to be said in regard to predisposing factors. Of the twenty-seven patients all but four were tobacco smokers, none chewed tobacco, twenty-three of the cases presented dental toilets that were all that could be desired, one had carious teeth; six had had tonsillectomies. Eleven, including one woman, had been in the late war, seven, also including a woman, had been overseas. None gave recent histories of acute infectious disease, none had stomatitis due to mercurials or other cause and all but two gave negative Wassermann reactions; in these two cases it was not practicable to obtain specimens of blood. In regard to trauma of the mucosa it may be noted that over fifteen hundred tonsillectomies have been observed during the past two years with no case of Vincent's angina as a sequel.

The pathology of the affection has been divided into three stages: the onset, characterized by congestion and edema; the formation of the pseudomembrane, and lastly the period of ulceration. It is scarcely possible to distinguish these stages in any given case.

The disease is commonly located on the tonsils or edges of the gums. In two of these cases it extended to the soft palate, in one to the pharyngeal wall, in one to the mucosa of the cheek. Some observers report infection of the tongue and lips but it did not appear in this group. The gingivitis and angina may appear simultaneously or independently; five of the cases presented gingivitis alone. The lesions on the tonsils are usually unilateral, in two cases they were bilateral. The lesions are usually rounded and vary in size from half a centimetre up to an ulcer involving practically the entire tonsil. The pseudomembrane is usually a greyish white, sometimes with a yellow tinge and of greasy consistency. This membrane is easily removed and leaves a bleeding surface beneath, which again becomes covered with exudate in a short time. As the disease progresses the ulcer rapidly becomes deeper but there is little indication of lateral extension. In two cases in this series the process extended very deeply, in one about two thirds of the tonsil was destroyed and an annular perforation through the anterior pillar appeared. In another the rounded tip of the tonsil necrosed away, continued treatment seemed to accomplish little, there was more or less constant oozing of blood and a tonsillectomy was performed. Section of the tonsil showed the organism throughout and smears made from the tonsillar fossa after operation showed the organism there also. The typical pseudomembrane appeared in the fossa but ulceration did not become extensive. This patient, a former overseas nurse, was under constant observation for five months and when last seen four months ago the lesion was entirely healed.

When the pseudomembrane is removed the ulcer appears as a bleeding, granulating area with irregular borders. It may be confused with a secondary syphilide. The area surrounding the ulcer is usually firm and healthy, the surrounding edema and redness stated by some authors has not been observed.

In all of the cases in this group in which the disease was located on the tonsils there were varying degrees of adenitis. The severity of the glandular involvement bore no relation to the extent of the tonsillar lesions. In the case of the nurse quoted above there was but little involvement of the lymphatics. But one case of adenitis was observed when gingivitis existed alone.

One of the outstanding features of this disease according to the older writers was the extreme degree of prostration and malaise displayed by the patient. Thus Osler describes the condition as "an acute febrile inflammation the general symptoms of which are severe." This is not borne out in the experience of those who encountered the disease in military practice. Record and Baker reporting fifty-six cases from Camp Devens found thirty-six patients complained of malaise, thirty-three had headache of moderate degree, and seventeen had backache. The average temperature was between 99° and 100°. In the present group seven complained of symptoms other than sore throat and dysphagia. Of these seven all had slight headache and backache, one had a definite chill. Three had temperature of 100°. One patient, one noted above as having had a chill, was definitely sick, with a chill, a temperature of 102.5° and was confined to bed for eight days. This and one other to be noted later were the only cases that were not ambulatory. All of the cases presented fetid breaths. The common picture presented by these patients is dry, sore throat, discomfort during swallowing, fetid breath, coated tongue, constipation and a varying degree of lassitude; the temperature may or may not be slightly elevated: The syndrome is much like that encountered in acute tonsillitis.

Various complications are reported by other observers, follicular tonsillitis, peritonsillar abscess, influenza, chronic interstitial nephritis, otitis media, septicemia, arthritis, pneumonia, pleurisy, polymorphous eruptions and appendicitis have been noted. In the cases here presented no complications were observed except herpes which was present in four cases including both women.

Contagion in this disease has been discussed by various writers, and all agree that it is transmitted from one person to another by close contact. Pencils, pipes, cigarette holders and eating utensils are undoubtedly responsible for its spread. Small epidemics in closely associated groups are frequently encountered. Five of the patients in this group lived in the same fraternity house, two others were brothers, the army nurse whose severe infection has been described was the fiancée of another patient included in the series.

It seems necessary that persons suffering from this disease should be forbidden intimate contact with others. They offer a difficult problem not unlike the diphtheria carrier. These patients are not very sick, most of them are ambulatory and strict quarantine is scarcely to be advised. The plan followed by the department of university health at Yale during the small epidemic of last year was apparently a satisfactory means for control. The patient was told that his disease was contagious, was warned against communicating it to others, and required to get his meals at the university infirmary where all utensils were sterilized. Similar control was applied to patients in private practice, and when they cooperate intelligently the result is satisfactory.

The diagnosis of the disease depends upon the microscopic examination of the exudate and demonstration of the organism. It will be most frequently confused with diphtheria and lues. In one of these cases, a boy fourteen years of age, the patient had received 20,000 units of diphtheria antitoxin and three reports negative for the Klebs-Loeffler bacillus had been returned from the laboratory before a correct diagnosis was made. Had smears been made from the material on the swab as well as from the incubated cultures the diagnosis could have been made at once. The lesion is not unlike a syphilitic ulcer and this differentiation must be made by the dark field examination. A positive Wassermann proves nothing for many observers have noted the two diseases existing coincidentally.

The prognosis in this disease is good, proper treatment bringing about a cure. Fatalities are rare in those cases in which angina and gingivitis exist alone. Noma is frequently fatal and in the only recorded cases of meningitis, brain abscess and peritonitis caused by this organism diagnosis was made at autopsy. The case with the shortest duration in this series presented a small patch on one tonsil that was healed in four days, the longest case required five months and surgical intervention to heal. Excluding this case which was unusual in many ways the average duration of the remaining twenty-six cases was twelve days.

Many methods for the treatment of this disease have been suggested: silver nitrate, chromic acid, potassium permanganate, zinc chloride, all have their advocates. In the cases treated in the army and those included in this report one method has been employed that has been eminently satisfactory, in fact it might almost be considered a specific. It is as follows: The pseudomembrane is removed entirely with a swab saturated with peroxide of hydrogen, or when available a power spray of peroxide, the ordinary hand spray not being sufficiently powerful. Much of the success of the treatment depends upon the thoroughness with which this membrane is removed. The bleeding base of the ulcer. is now thoroughly swabbed with a five per cent. solution of salvarsan in glycerine, the swab rotated and the salvarsan rubbed deeply into the ulcerating surface. This is done twice each day at the start, later once a day is often enough. For practical purposes .6 gram of salvarsan in one ounce of glycerine makes the proper solution; it should be shaken before using. Old salvarsan, neosalvarsan and the recently developed silver salvarsan were used but there was no evidence of any superiority of one above the others.

The question as to what might occur if an appreciable amount of the salvarsan solution was swallowed gave some concern until some time ago there was reported from Berlin the case of a woman who for six consecutive days took .3 gram of neosalvarsan in a glass of water. For ten minutes after ingestion she had suffered from slight abdominal pain. Three days after the first dose diarrhea set in but at the end of six days the stools were normal. The patient showed no objective pathological symptoms, the urine was free from sugar and albumin, and no arsenic could be demonstrated in the urine.

Some clinicians advocate the intravenous administration of salvarsan, but in view of the fact that this procedure is not entirely devoid of danger, and having in mind the satisfactory results obtained with the local application of the drug its intravenous use in the treatment of the ordinary case of Vincent's angina is not recommended.

Brief mention should be made of the frequent occurrence of infection with this organism with acute leucemia, several writers having recently noted this coincidence. Two such cases have come to my attention, both fatal, in which there was widespread gingivitis due to this organism. No blood cultures were made. One observer has seen twenty-two such cases, nine of the patients apparently recovering after the intravenous administration of salvarsan. The cause of acute leucemia is as yet unknown, and whether this organism of Vincent may be an etiological factor, as some writers seem to believe, or whether the frequent occurrence of gingivitis and stomatitis is due to lessened resistance dependent upon the leucemia has yet to be proved.

In conclusion, attention should be centred upon certain important facts in connection with this disease. First, it is an infection that is frequently encountered and in all cases of membranous sore throat smears made directly from the exudate should be examined as well as incubated cultures. Second, the disease is readily communicated by direct and indirect contact and precautions against its spread should be instituted at once after diagnosis is established. Third, the application of salvarsan directly to the lesions is a safe and satisfactory method of treatment.

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The Status of Lumbar Puncture and the Prevention of Its Complications

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The extensive use which socalled lumbar puncture has gained for itself, the manner of its employment as well as the attitude toward the same through its much widened indications, make it pertinent perhaps to inquire briefly what its status is, what, if any, safeguards should properly circumscribe it, and finally, how its attendant risks and complications may at least be substantially lessened, if they cannot be entirely eliminated.

Introduced originally by Quincke as a therapeutic measure designed to relieve hydrocephalus, its development soon entered a prolonged period in which it became a diagnostic rather than a therapeutic measure, which gradually extended itself beyond the domain of neurological investigations to various other fields, such as pediatrics, surgery, internal medicine, and particularly to that sizeable one of "obscure diagnosis." Not until the introduction of Flexner's serum did its therapeutic use really come into its own, and the simultaneously developing direct intraspinal therapy of specific cerebrospinal lesions has given it a therapeutic field as wide as the diagnostic. Indeed the puncture of the subarachnoid space has become so routine a procedure that, aside from those conditions in which its use is imperatively indicated, an extended clinical investigation is regarded incomplete without it.

But even among its earliest users it was soon discovered that this procedure was not unattended by serious risks, and Oppenheim was among the first, if not the first, to sound the warning of *nil nocete.* Neurologists naturally first noted accidents and complications of various sorts and we find accordingly among Schoenbeck's frequently quoted collection of seventy-one deaths, which occurred immediately or very shortly following puncture and which were reported between 1895 and 1914, that thirty-seven of these terminated cases of intracranial tumor. Thus suspected or definitely diagnosticated intracranial tumor fairly early became regarded as a contraindication; nonfatal accidents and sequelæ received little attention. But relatively just as little attention is accorded these latter now well known possibilities in two recent monographs on the cerebrospinal fluid, although Boyd makes note of a "remarkable diversity of opinion concerning the frequency of untoward aftereffects" and remarks that the procedure is not so essentially harmless. Levinson minimizes the danger of death, which probably applies more especially to those conditions for which puncture is done in children. Quincke himself in 1914 reviewed his experience, laid down well defined indications and particularly advocated a careful technic, which included among other things manometric control—this latter at that time rarely mentioned in the American literature.

Yet puncture is rather commonly practised, to say the least, indifferently; it is still done in the office or the ambulatorium, and the patient sent about his business or instructed to rest at home. One of the commonest aftereffects—the bitterly complained of headache—makes subsequent punctures more difficult to obtain consent for. It remained for Frazier to give the entire matter of puncture comprehensive treatment and to accord the problem of its possible complications adequate and systematic exposition. Frazier logically places all these complications into two groups: those due to damage produced at the puncture site and, secondly, those due to the remote effects of withdrawal of fluid.

In so far as the first group is concerned, it is obvious that the degree of local trauma produced must depend largely on the manner of introduction of the needle. In a careful study of this point, Regan called attention to the marked topographical differences which exist at different ages in the path which the needle must pursue; and that in consequence the age of the patient and the amount of flexion of the spine possible are moments that should be taken into account in determining the manner of puncture. On anatomical grounds Regan, moreover, conclusively shows the great advantage ordinarily of the median route in adults as well as children, other things remaining equal. It offers, as a rule, the greatest chance of immediately successful entrance and therefore the minimum degree of trauma. In any event, no very great skill or anatomical knowledge should be necessary to avoid such an accident as aortic puncture. Nevertheless, even under optimal conditions, there does, and must in the nature of things, occur a small measure of injury to the meninges, and perhaps to the nervous parenchyma, which in the light of recent investigations may attain under certain circumstances very considerable significance. Wegeforth and Latham—stimulated doubtless by certain curious and heretofore inexplicable experiences in military hospitals—have shown that it is possible to produce meningeal infection under certain conditions, by puncturing an animal in which a septicemia has been just previously induced. This has been confirmed by Reginald Webster, who worked with monkeys and who showed furthermore that the probability of meningeal localization taking place varies directly with the intensity of the septicemic process. The possible existence of a general septicemic process should therefore make a contemplated puncture a procedure not to be undertaken without a little circumspection, if the first principle underlying any diagnostic or therapeutic measure be to do no harm. Webster wisely denies to puncture the function of a "possible royal road to the diagnosis of an obscure condition."

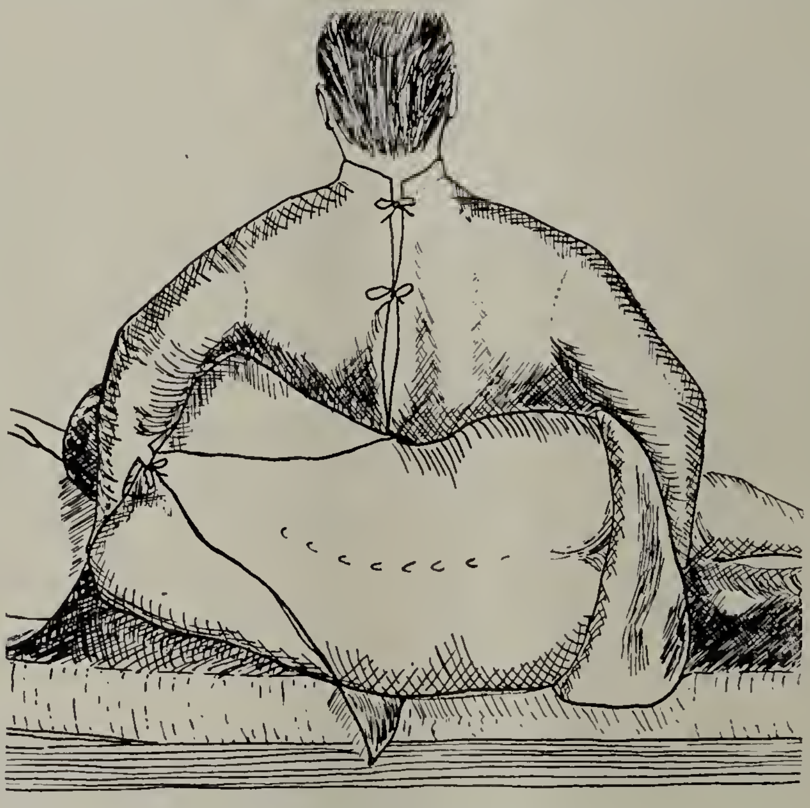

Fig. 1.—Posture and control of patient in lumbar puncture. Spine is flexed and the entire patient held securely in the manner shown. The buttocks rest close to the edge of the bed giving convenient working room.

A secondary condition substantially influencing the frequency of various mishaps pertains to the posture of the patient. Aside from the immediate advantage of the influence of gravity in obtaining fluid, the vertical position offers many disadvantages and has in consequence fallen into relative disfavor. If the alternative horizontal posture be employed in a uniform manner—the spine being simultaneously flexed and fixed to the maximum degree and the entire patient effectively controlled in the manner shown—a considerable part of the accidents due to otherwise unavoidable but unnecessary local trauma can be prevented. If the patient is unable suddenly to extend the spine, an effective method of physical restraint, such as is pictured herewith (Fig. 1), makes it almost impossible for him to pinch off the steel needle ordinarily employed. In a fairly large number of punctures this posture and method were found uniformly satisfactory without any form of local anesthesia. It goes without saying, of course, that special conditions may require some modification; opisthotonus or a pathological degree of irritability may even compel some form of anesthesia.

Frazier's second group of complications—those due to the remote effects of puncture—are doubtless of considerably greater importance. Even if the physiological conception of the cerebrospinal fluid as a simple mechanical water bed could be maintained—and scarcely anywhere in physiology can we find so simple a functional interpretation—it would be necessary to take into account the fact that withdrawal of cerebrospinal fluid from the intact nervous system of an animal produces distinct, abnormal circulatory changes, namely hyperemia and punctate hemorrhages, within the brain and cord (Ossipow). Since these are doubtless changes due to more or less suddenly altered pressure relations, and since the mechanism regulating the normal intraarachnoid pressure is not known, it would appear that herein lies a factor, too long ignored, and of the very greatest importance. It has, moreover, been emphasized by Quincke that the reading at the puncture site is not the actual pressure throughout the higher levels of the subarachnoid space, in which pressure changes, owing to the anatomical subdivisions of the latter, take place more slowly. It is nevertheless reasonable to suppose that the rate of pressure change at any level of the canal is directly dependent on the rate of fluid withdrawal. To do no harm, therefore, will require that the intraarachnoidal pressure relations during fluid withdrawal be manometrically controlled and that the fluid volume removed be governed by the pressure readings. Quincke, in this connection, advises that when puncture is done for therapeutic purposes and the initial pressure is normal, the end pressure shall not be permitted to fall below 100 mm. H_2O; if increased initially, to not less than forty to sixty per cent. of the maximum.

It is obvious that such considerations as these perhaps do not apply with equal force to such conditions—as in meningitis—in which a very great increase in pressure owing to increased fluid volume exists, as they do in cases of present increase due to space encroachment, as, for example, in brain tumor; or again, to conditions in which there is a marked disturbance in the interrelationship between the intraarachnoidal and the intravascular pressure. Quincke does not regard the suspected existence of an intracerebral tumor a positive contraindication, but insists that puncture be surrounded with the necessary safeguards, chief among which is manometric control.

It has not been the purpose in the foregoing to enumerate the entire formidable list of possible complications and sequelæ of lumbar puncture; nor has it been intended to convey the impression that anyone is able with our present facilities and knowledge absolute to avoid all of these. It is not possible, for example—no matter how skilful the technic—to avoid wounding at times the intraspinal venous plexus, with its resultant difficulties due to bloody fluid and the rapid plugging of the needle with clot. Nor is it possible invariably to avoid nerve roots, although Regan assures us that the median route renders this much more likely. Yet it would appear that the total incidence of accidents and certainly by far the greatest part of the more serious ones are avoidable.

Accordingly it is submitted that so valuable a procedure as lumbar puncture should not be approached in a spirit of perfunctoriness; that it contains the elements of a minor surgical attack when properly safeguarded, though one with maximally awkward possibilities when indifferently executed; and finally, that most, if not all, of its dangers may be avoided by manometric control of the fluid, by the exercise of circumspection and the use of a certain amount of anatomical knowledge, and by the abandonment of its practice in the ambulatory patient altogether.

30 North Michigan Avenue.

The Operative Treatment of Scoliosis*

By S. KLEINBERG, M. D., F. A. C. S.,
New York.

It is, I believe, generally known and admitted that we are able by means of corrective jackets applied over a long period of time, to improve about sixty to seventy per cent. of cases of structural scoliosis including all types. The treatment which I have found most effective is carried out with the spine in extension but with certain important modifications and details. In brief, the method is as follows: The patient is suspended until the feet barely touch the floor. The pelvis is fixed, the chest twisted toward the side of the convexity, lateral traction is applied over the most prominent part of the deformity and countertraction on the shoulder and pelvic girdles. It is essentially a fixation of the trunk in an attitude opposite to that of the deformity. During the treatment no chance for even momentary relapse of the deformity is allowed. The treatment is one of gradual stretching, and at each application of a jacket an attempt is made to improve further the appearance of the back and to reduce the curvature. With this treatment carried on continuously for one to five years we are able in the majority of the cases to prevent the deformity from getting worse and to obtain a marked degree of improvement. With appropriate aftercare by means of corsets, exercises, attention to posture, clothing, seating, etc., we are able to retain the improvement.

This treatment is, however, not wholly satisfactory. To be effective it must be prolonged over a period of years. It is more or less uncomfortable to the patient and frequently interrupts school or business. It requires also an expenditure of a great amount of energy on the part of the surgeon.

There are additional observations which have urged us to seek a shorter and perhaps more effective treatment. It is a well known fact that in a certain proportion of the cases the curvature of the spine and the deformity of the trunk become exceedingly marked so that not only is the deformity conspicuous but there is an actual interference with the function of the internal organs, especially the lungs and gastrointestinal tract.

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*Read at a meeting of the Alumni of the Hospital for Ruptured and Crippled, November 21, 1921.

All cases are mild at the start, but relatively few remain mild. In a given case of mild scoliosis in a child it is impossible to predict the course of the scoliosis. The deformity may remain stationary or may become worse. In certain types, as rachitic, paralytic and cervicodorsal curves of all varieties, it is almost certain that the condition will grow worse and that at least some of the patients will develop into razor backs. In some cases, even with treatment, the deformity becomes worse. It has also been observed that a scoliotic deformity may remain stationary for years and then, even in adult life, grow worse. These facts have led to the trial of a different system of treatment which may be divided into the preoperative and operative stages.

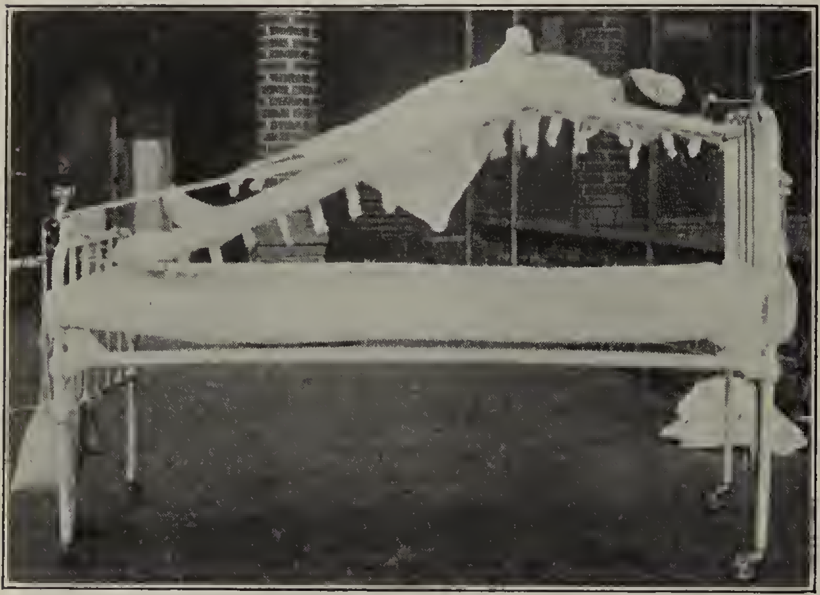

FIG. 1.—Frame used in the preoperative and postoperative treatment of scoliosis. Traction is applied to the head and to the pelvis.

PREOPERATIVE TREATMENT.

It has been observed that when the trunk is in extension there is a reduction of the prominence of the projecting ribs and an improvement in the appearance of the back, just as there is an exaggeration of the deformity when the trunk is flexed. It was, therefore, suggested by Whitman that the patients be given a period of treatment in extension or hyperextension on a convex stretcher frame. The frame, which is the same as that used for Pott's disease, is supported on the ordinary hospital bed and the patient is placed upon it. This treatment is continuous, and the patient is not permitted to get off the frame or even to sit up. After a few days, when the patient has become accustomed to the frame, traction is applied to the head and pelvis, and in some cases lateral traction is used over the convexity.

In those cases which are amenable to improvement, that is in all but the severe cases, there is observed a marked change in the appearance of the back in about four to eight weeks. The projection of the ribs and the curvature of the spine are reduced. The degree of improvement obtainable, so far as my present experience goes, is about the same as that accomplished with jackets after many months of treatment. The only difference appears to be this, that the reduction of the deformity on the frame occurring rapidly tends to disappear almost immediately when the patient is stood up. In the plaster jacket treatment, however, the improvement takes place very slowly and is the result of actual change in the bony and soft structures, and hence either remains when the jackets are taken off or disappears gradually.

As in the treatment with jackets a maximum degree of improvement is reached beyond which it seems impossible to change the spine. So far I have found that the maximum degree of reduction of the curvature is obtained in about eight weeks.

OPERATIVE TREATMENT.

When the back has been improved as far as possible by this method a fusion operation is performed. As immobilization of the back has given good results, internal fixation of the spine by fusion and splinting of the vertebræ is believed to offer, through more accurate immobilization, opportunity of arresting the deformity at whatever stage we see it. Fusion of the spine is undertaken in the belief that a solid column such as a fused spine will have less tendency to bend and become crooked than a segmented column made up of a number of vertebræ.

At first I did the Hibbs fusion operation. I found that there resulted a certain degree of stiffening of the back, but that complete bony ankylosis did not occur except perhaps in the dorsal region. The x ray, by the way, was of no help in determining the presence of ankylosis. In the dorsal spine, where there is normally only a slight amount of motion, it is difficult to determine whether there was complete bony ankylosis after operation. Clinically the dorsal spine was more favorably affected by the operation than the lumbar. Flexion of the dorsal spine after fusion operation was very markedly restricted and in some cases apparently entirely eliminated. In the lumbar region the degree of stiffening was very much less marked.

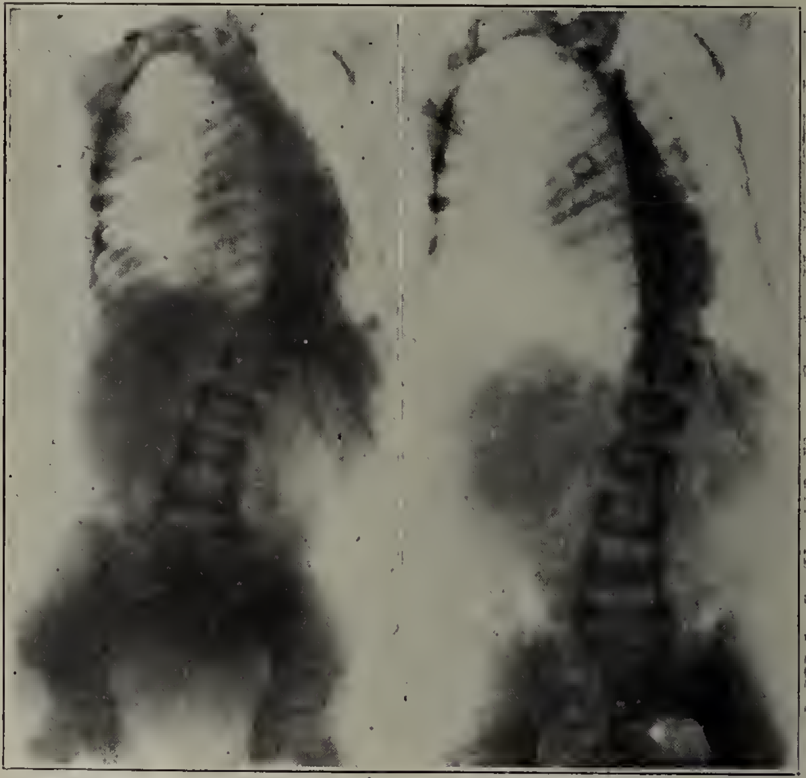

FIG. 2. FIG.

FIG. 2.—Paralytic left dorsal scoliosis. Picture taken before treatment was begun.

FIG. 3.—Picture of same patient as Fig. 2 taken some time after the operation, showing the reduction of the curvature, the graft extending from the fourth dorsal to the second lumbar vertebra.

As the simple fusion operation did not result apparently in solid bony ankylosis, I modified the operation by adding to the ordinary Hibbs fusion, splinting of a comparatively large number of vertebræ by means of a stout beef bone graft. The technic is a combination of the methods devised by Albee and Hibbs, with the exception that I use a beef bone graft to shorten the time of operation.

The graft is long enough to extend from one end to the other of a single curve or of one section, preferably the dorsal, of a compound curve, Usually the graft is about eight inches long and extends from the second or third to the twelfth dorsal vertebræ. The typical Hibbs fusion operation is performed on the most curved part of the spine. The spinous processes of the two uppermost and the two lowest vertebræ of the operated section are then split and the graft is laid on the laminæ and transverse processes on the concave side of the curve, the ends of the graft being imbedded in the split spinous processes. The periosteum and muscles are sewed with kangaroo tendon, and the subcutaneous tissue and skin sewed with catgut.

POSTOPERATIVE CARE.

The patient is put back to bed and not on the frame. After about a week or ten days the patient feels comfortable and can be again placed on the frame. Traction is then applied to the head and pelvis, and maintained for about eight weeks. During this time healing becomes very firm and the patient receives a supporting brace or plaster jacket or corset which is to be retained for about three to six months.

This is a preliminary report and my experience has not extended over a sufficient length of time to warrant conclusions as to the nature and permanency of the results. It is hoped, however, that the preoperative treatment on the convex stretcher frame will yield the same degree of improvement as is obtained by the more prolonged treatment in plaster jackets, and that the fusion and splinting of the spine will retain the improvement and prevent increase of deformity.

1 West Eighty-fifth Street.

Colon Bacillus Pyelitis

By PHILIP GOLDFADER, M. D.,
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Pyelitis, strictly considered, is an inflammation of the mucous membrane of the pelvis and calices of the kidney, in contradistinction to pyelonephritis which means an infection of both the pelvis and parenchyma of the kidney. Acute colon bacillus pyelitis does not exist as a clean cut pathological entity. As a rule, all cases of acute pyelitis are associated with varying degrees of pyelonephritis. In the subacute and chronic forms, the involvement of the parenchyma subsides and it is then that we have an almost true pyelitis. Strictly speaking all infections of the kidney, from the mildest to the gravest, represent different stages of the same condition. In a case of pyelitis with obstruction the advent of other bacteria may convert the kidney into a pyonephrotic sac.

The actual exciting cause of pyelonephritis is always a bacterium. In one hundred and forty cases recorded by Kidd, one hundred and seventeen were due to the colon bacillus, nine to the streptococcus, twice in conjunction with the colon bacillus; seven cases were due to staphylococcus, once in conjunction with the colon bacillus; two to the gonococcus, one to the proteus bacillus, one to the paratyphoid bacillus, one to the bacillus asiaticus, one to the paramalta fever and in nine cases no bacteria were determined. Predisposing causes according to Kidd may be divided into four groups.

A. Causes which promoted bacterial invasion of the blood stream at a primary focus of infection: 1. Throat infections—dust stirred up by spring cleaning. 2. Bowel infections—infected food. 3. Family infections—carriers of bacteria.

B. Causes which stirred up bacteria already lying dormant in a primary focus: 1. Gunshot wounds, especially cases of septic compound fractures. 2. Operations in septic fields—stitch abscess after appendicitis, and after excision of rectum. 3. Bowel infections, such as constipation, diarrhea, colitis, gastric ulcer, gallbladder infections, typhoid fever and dysentery.

C. Causes which lowered the general resistance of the blood and tissues to bacterial invasion: 1. Physical overexertion, mental and emotional overexertion, fatigue, chill, etc.

D. Local mechanical, physical or chemical causes which lowered the resistance of the kidney and rendered it susceptible to infection by bacteria when filtering through it: 1. Stone in the kidney or ureter. 2. Congenital hydronephrosis. 3. Enlarged prostate. 4. Stricture of the ureter. 5. Vaginal prolapse with cystocele. 6. Pregnancy. 7. Splanchnoptosis, etc.

Much controversy has arisen as to the route of invasion. The consensus of opinion seems to favor the hematogenous route. It is a well established fact that organisms may be found circulating in the blood of patients suffering from various ailments as well as in individuals in apparently good health. The sources of these organisms are innumerable. The bacteria may be derived from focal infections in various parts of the body, or catarrhal infections of the various mucous membranes. The intestine is the usual source of the colon bacillus infections, while other bacteria are derived from foci of low grade infections in the vagina, urethra, tonsils, teeth, adenoids, furuncles, accessory nasal sinuses, appendicitis, etc.

One of the most convincing series of experiments, bearing immediately upon focal infections and pyelonephritis, has been completed by Bumpus and Meisser of the Mayo Clinic. Their studies were based upon a series of cases presenting subacute lesions of the urinary tract with dental or tonsillar sepsis, and colon bacilli predominating the urine. Not only were they able to produce in the majority of the animals injected definite renal lesions from cultures taken from the teeth or tonsils, but in two of their cases, showing marked exacerbation following tooth extraction, they were able to recover streptococci from the urine, which, when injected into animals, produced lesions of the urinary tract, identical with those obtained from cultures of the teeth. These experiments show conclusively that streptococci isolated from infected tonsils and teeth manifest a striking selective affinity for the urinary tract, for of the twenty-six animals injected with primary cultures, twenty-four had lesions of the kidney and eight showed lesions in both kidney and bladder. Further, they were unable in those patients, whose urine showed only colon bacilli, to produce in animals any definite renal lesions by intravenous injection of culture from this source.

A large number of the organisms are carried to the liver, where they are destroyed by the cells and endothelium and are excreted in the bile, while bacteria which enter the general blood stream reach the kidney and are excreted in the urine. W. Wyssokomitsch (2) experimented on dogs with the anthrax bacillus, streptococcus and staphylococcus, and concluded that bacteria appeared in the urine only after there had been a focus of infection in the kidney. Briedl and Kraus (3), by a series of very careful experiments, showed that in dogs and rabbits staphylococci appeared in the urine as early as twelve minutes after being injected into a vein. The urine which contained them had no albumin and the kidneys on microscopical examination seemed perfectly normal. The appearance of typhoid bacilli in the urine, without pus or albumin, and the very large percentage of positive findings of tubercle bacilli in the urine during a case of florid tuberculosis, show that there can be but little question of bacteria being frequently excreted through healthy kidneys. The sole condition of this excretion is the presence of bacteria in the blood. A kidney may excrete bacteria indefinitely without involving the kidney tissue, but if for some definite reason the resistance of the kidney is lowered, involvement of the kidney tissue may follow. This may be caused by the constant irritation of the excreted bacteria and their toxins. The most frequent predisposing cause is obstruction to urinary drainage such as that due to a movable kidney, with kinking narrowing or twisting of ureter, calculus, hydronephrosis, stricture of the ureter, pressure of a pregnant uterus on the ureter, stricture or obstruction at or below the vesical neck. But the most important predisposing causes of all are those which lower the general resistance of the body, such as overwork, worry, fatigue, chill and starvation.

There are three paths by which bacteria might reach the kidney: 1, By ascent of the urethra and ureter; 2, by descent from the blood stream, and 3, direct from neighboring tissues, such as the colon. Ascending renal infctions, i. e., from the bladder directly through the lumen of the ureter to the renal pelvis, was the accepted theory until the work of Brewer (4) pointed out its fallacy. Draper and Braasch (5) proved conclusively that infection by ascension up the ureter is possible, but exceptional, occurring only in cases presenting marked changes in the vesical orifices of the ureters due to prolonged cystitis. Embleton and Thiele, experimenting on animals, showed that they placed doses of bacteria on the mucous membrane just within the urethra and proved that the bacteria were thence rapidly absorbed into the lymphatics of the urethra and so passed along the wall of the bladder and ureter and collected beneath the capsule of the kidney. From there they did not infect the kidney or enter the urine stream, but they passed rapidly through the lumbar glands into the thoracic duct and so into the blood stream. They also found that after intraperitoneal inoculation, bacteria appeared in the urine from ten minutes to half an hour. If the thoracic duct was cut they did not reach the kidney or the urine at all, which proved that they had reached the kidney by the blood stream. These facts would seem to show that lymphogenous renal infections do not occur. It has been supposed that bacteria spread to the kidney direct from the colon. The kidney is separated from the colon by the perinephric fascia and its lymphatics are not related to those of the colon. If bacteria infected the kidneys by direct spread we should expect to find inflammation and abscesses in the perinephric cellular tissue. This is just what we do not find, except in the rarest of instances. There can be little doubt that bacteria in life do not commonly spread directly from the bowel to the kidney.

PATHOLOGY.

As infections of the kidney are as a rule hematogenous in origin, bacteria enter the kidney through the renal arteries, pass to the cortex and escape through the glomeruli to the collecting tubules, thence to the papillæ and the renal pelvis. Cases of long duration exhibit a kidney adherent in more or less fibrolipomatous perinephritis. The kidney itself may not be materially increased in size, but the pelvis and upper ureter are likely to be thickened, dilated and surrounded by adherent sclerotic fat. Petechial spots and superficial ulcerations may be seen in the mucous membrane of the pelvis. At this point it may be noted that bacillus infections usually produce lesions of the pelvis and medulla, while coccus infections involve the cortex. Abscess formation is usually dependent upon mixed infection.

Cabot and Crabtree (7) divide these cases into two main groups: 1. The nonpyogenic type, the pure colon bacillus infection, which develops in the kidney that has previously been sound. 2. The pyogenic or suppurative type, which develops in a kidney that has previously been unsound. These are usually cases of renal or ureteral calculi, obstruction, tumor, or chronic nephritis, and are usually mixed infections.

SYMPTOMS.

Except in the fulminating and hyperacute cases the onset is gradual rather than sudden and is marked by prodromal symptoms of a generalized blood infection, rather than by any local urinary symptoms.

The symptoms of pyelitis are not as a rule marked and the condition may exist for a long time without giving rise to the suspicion of its presence. In acute cases there is a slight evening rise of temperature, but in chronic cases there is no rise of temperature. These patients, as a rule, come for relief from bladder symptoms. Frequency of urination is always present and is due to the polyuria which exists. Frequency is associated with dysuria and tenesmus. The patient may complain of a dull pain or heavy feeling in one or both loins and slight tenderness on pressure at the angle of the twelfth rib. In the severe cases, chills, high fever, nausea, vomiting, headache, which are signs of renal insufficiency and blood invasion by bacteria, may be observed. The urine is abundant, of low specific gravity, and contains pus, epithelium from the pelvis of the kidney, blood cells, hyaline and granular casts. If one kidney is affected there may be periods when, owing to obstruction of the diseased pelvis, the urine will be normal. In the chronic stages, red blood cells may be absent. The phenolsulphonephthalein test shows the amount of renal impairment. Colon bacilli are usually found in pure cultures, especially in the chronic cases. At other times the staphylococcus or streptococcus may be present in addition to the colon bacillus.

DIAGNOSIS.

In order to diagnose this condition, a complete and careful examination is necessary. On palpation of the kidney slight tenderness may be noted at the angle of the twelfth rib, and Murphy's sign may be elicited. In uncomplicated cases the kidney is not enlarged. The following technic is employed in all kidney cases as a routine procedure at the Brooklyn Hospital. The patient is prepared for cystoscopy and the x ray—the intestinal tract being thoroughly cleared out. He is advised to drink about a quart of water an hour before the examination. The bladder is first examined with the observation telescope, first taking a sterile specimen of urine from the bladder for examination. On viewing the bladder, the ureteral mouth on the affected side is usually pouting and prolapsed and may be engorged with blood, the stream of urine comes from the ureter in steady drops and not in spurts, which is due to the lack of rhythmic contractions of the pelvis of the kidney and ureter. The condition of the mucous membrane of the bladder is noted, which may be apparently normal or intensely congested and a search is made for stones, diverticula, hypertrophied prostate, etc. This is followed by catheterization of both ureters, using opaque catheters. The urine from each kidney is collected for examination, which should include a microscopical examination, the estimation of the urea output, and a cultural study of the separate urines to determine the organism present. The functional capacity of each kidney is then determined by injecting intramuscularly one c. c. of the standard solution of phenolsulphonephthalein into the muscles of the buttocks and noting the time appearance of the dye on each side. In operative cases the phenolsulphonephthalein is usually collected for two hours and the amount of dye eliminated is then estimated. X ray examination of the urinary tract with opaque catheters *in situ* is then performed and a pyelogram of the pelvis of the kidney suspected of being involved is then made, using a twenty-five per cent. solution of sodium bromide. In cases in which a stricture of the ureter is suspected, a pyeloureterogram is made. In cases with ptosed kidneys the x rays should be taken with the patients in lying and standing positions. Stones in kidney or ureter, strictures of the ureter, enlarged prostate, ptosed kidney, may be diagnosed by this examination. A rectal examination should never be omitted, particularly in the male, as by this examination inflammatory conditions of the prostate and vesicles may be detected. It may also reveal the source of infection such as a fissure or fistula. An expression smear should be obtained by gently massaging the prostate and vesicles and the fluid examined for pus and bacteria. Examination of the stools should be made in cases of colitis, for this lesion may be the source of infection. A vaginal examination will often reveal prolapse of the anterior vaginal wall with cystocele, a definite but not very common predisposing cause. Smears and cultures should be made from the cervical and urethral secretions.

TREATMENT.

Cases belonging to the first group are usually relieved by conservative methods. In acute pyelitis rest in bed, alkalies, urinary antiseptics, free catharsis, the ingestion of large quantities of water, salt free and meatless diet, usually are sufficient to control mild cases. The alkali is best given as potassium citrate in sixty grain doses every two hours until the urine becomes alkaline as tested by litmus paper, then every three hours, and finally every four hours. As a rule the alkalies should be continued for about ten days. The fever usually disappears in twenty-four to forty-eight hours. On the tenth day, if the temperature has been normal for a few days, discontinue the alkalies and give a mixture containing thirty grains of acid sodium phosphate, to be taken four times a day. Dissolve in each dose ten grains of urotropin. The urotropin and the acid sodium phosphate should be continued for a few months. The bladder symptoms are ameliorated by daily bladder lavages with acriflavine one in four thousand or oxycyanide of mercury one in four thousand. Infected and thrombotic hemorrhoids, rectal ulcerations, uterine and urethral disorders must be treated.

In the majority of the acute cases the patients get well under conservative treatment. Those that persist in spite of these measures are due to the presence of an infective focus or defective drainage. It is only in cases of pyelitis of pregnancy and in the acute cases that do not clear up by natural resolution that renal lavage is indicated. If the pus in the pelvis is thick, the pelvis should be first irrigated with a solution of boric acid. For pelvic lavage any of the following solutions may be employed: argyrol, twenty-five per cent.; silver nitrate, five tenths to two per cent.; or mercurochrome—220, five tenths to one per cent. The lavage may be repeated within five or six days as indicated. Usually few irrigations of the pelvis are necessary to obtain a bacteriological and clinical cure. Autogenous vaccines, in addition to other measures, may be of service.

The treatment as outlined helps to clear up about sixty per cent. of the cases of acute pyelitis.

Nephrectomy is indicated in the fulminating cases. In the treatment of chronic cases general hygienic rules, if observed by the patients, will materially aid in obtaining a cure. Since the majority of cases are due to bowel infections attention must be directed to the daily evacuation of the bowels. The diet should be generous. The meals should be regular, well masticated, and should consist of fresh food. The only things to be avoided are strong meat extracts, soups and condiments. Internally, give urotropin, ten grains four times a day. If improvement is not seen in one or two months then resort must be made to renal lavage.

The treatment of cases belonging to the second group is purely surgical. Movable kidneys, if causing ureteral kinking, should be anchored in order to promote free drainage from the kidneys, stones in the ureter or kidneys should be removed, hypertrophied prostates enucleated, strictures dilated. The surgical indications in each case are to be met in a manner which best suits the individual case.

CONCLUSIONS.

1. Colon bacillus pyelitis is quite common and is often overlooked.
2. The vesical symptoms are often the first indication of the condition.
3. The infection is as a rule hematogenous.
4. The original focus of infection must be found and eradicated.
5. Cases falling under Group I are to be placed on medical treatment, not neglecting to treat the bladder.
6. Pelvic lavage is to be employed when the medical treatment is seen to be inadequate, and is of especial value in the chronic cases.
7. Surgical measures are indicated in cases falling under Group II.

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123 REID AVENUE.

Case reports will appear in the author's reprints.

A Case of Pulmonary Abscess

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The case herein reported presented considerable difficulty in diagnosis, perhaps due to the relative infrequency with which chronic pulmonary abscess of this type is met with. Our patient was seen by a number of physicians during a period of about twelve months and his condition remained unrecognized. It was only after a period of observation lasting about three weeks that we were able, with the aid of the x ray and laboratory, to make a probable diagnosis. We were not fortunate enough to obtain the patient's consent for an operation and he left the hospital on his own responsibility.

CASE I.—E. P., aged fifty, widower. Besides the ordinary diseases of childhood, the patient had had a severe illness at the age of nine, which lasted several weeks. He did not know the nature of his illness, nor did he remember any of its symptoms. In 1914 he had repeated attacks of vomiting after eating, associated with pain in the epigastric region and constipation. This lasted for about a year and resulted in the patient losing over a hundred pounds in weight, and left him in a weakened condition. He had never fully recovered from this weakness and had never worked since. Three years ago he had a skin eruption involving face, arms and legs. This eruption came on suddenly and lasted a short time. There was no sore throat at the time. His wife died at the age of forty-two of unknown causes. She had had eight miscarriages and three living children, all of whom died in early infancy of causes apparently other than luetic.

The patient's bowels had been constipated for the past year or so, appetite poor for the past two or three years. For the past year there was almost complete anorexia. He slept fairly well, but was disturbed by a nocturia, which had lasted for about three years. He also had frequent micturition during the day. The patient had taken an excess of beer, wine and whiskey up to two or three years ago. (Patient had been in the liquor business.)

The present condition dated back to about September, 1919, when the patient had an attack of pain in the right side of his chest, associated with dyspnea and a moderate rise in temperature. At the time he was observed at the Beth-Israel Hospital and the following data were then obtained:

Temperature between 100° and 101°, moderate cough and expectoration. The blood count showed a slight leucocytosis. The urine showed a few white blood cells. An x ray of the chest showed a triangular area of clouding at the right hilum, base toward hilum and the apex directed outward. The picture did not change at a subsequent examination done sixteen days afterwards. The condition was then thought to be unresolved pneumonia. He left the hospital on a release.

One month after leaving the hospital, while the patient was still in bed, he had an attack of hemoptysis, coughing up about three pints of blood. Since then the patient had had a cough which was productive in character and constantly becoming worse. About that time his gastric symptoms returned and he had had considerable nausea, vomiting and pain after eating. He was losing weight and lately there developed marked dyspnea and weakness.

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*From the service of Dr. Henry J. Wolf.

He entered Lebanon Hospital about a year after the onset of his lung symptoms, complaining of hiccough, dull ache in the right chest, a rather severe cough and productive sputum. The sputum was stringy, mucopurulent and odorless in character. He also had anorexia and frequently a sense of oppression in the epigastric region, occasional attacks of cramplike pain, associated with diarrhea.

In general appearance the patient was asthenic, anemic, quite dull looking, apparently there had been considerable loss of weight. The pupils were slightly irregular, right somewhat larger than the left, and reacted sluggishly to light; the eye grounds were negative. The only positive chest signs were those of emphysema with an area of moderate dullness, diminished breathing, at times distant bronchial breathing over the right lower lobe posteriorily. This area did not extend quite to the posterior axillary line. These signs became somewhat more marked later in the course of the illness, especially after the chest puncture, so that râles and distant bronchial breathing were more constantly found. The abdomen was retracted, soft, the skin wrinkled, loss of subcutaneous fat, liver barely palpable. There was a marked clubbing of the fingers and toes. The knee jerks were markedly diminished.

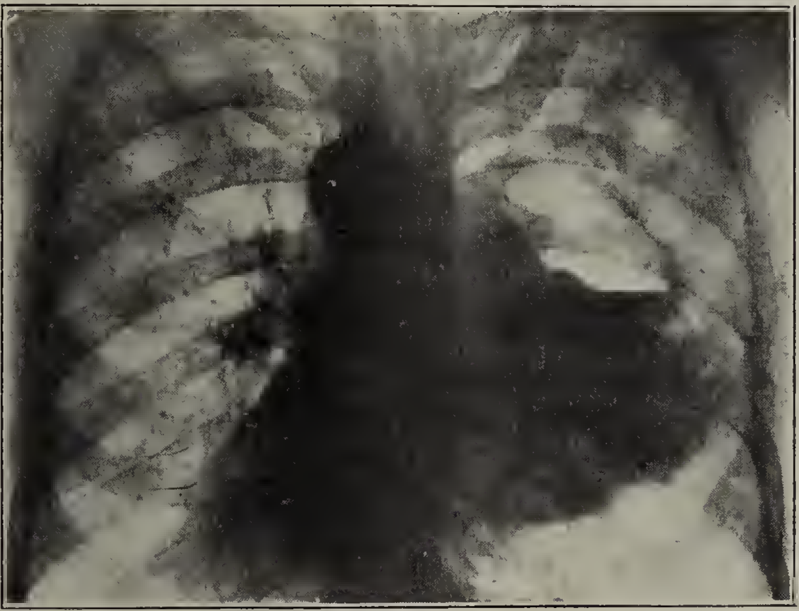

Fig. 1.—Shows a large area of cavity formation with fluid below and air or gas above with a thick fibrous wall.

While in the hospital the patient grew perceptibly weaker and duller, his cough had become worse and more productive, his sputum was slightly rusty for a few hours after the first chest puncture. The temperature ranged between 98° and 100.5° F., pulse between 70 and 92, respiration between 18 and 26. His appetite remained poor, in spite of carminatives and bitter tonics. He vomited several times during his stay in the hospital, was more or less constipated, but had occasional attacks of diarrhea. He slept well and was quite drowsy during the day. He lost in weight slowly but steadily, going down from 123 to about 105 pounds.

The urine showed a faint trace of albumin. The sputum showed no tubercle bacilli, but occasional elastic fibres, many pus cells. Sputum culture gave influenza bacilli and Micrococcus catarrhalis. The blood count, done several times, showed an average white blood cell count of 14,000, polymorphonuclears eighty per cent. to eighty-five per cent., lymphocytes fifteen per cent. to twenty per cent., hemoglobin sixty per cent. to seventy per cent., red blood cell count two to three million. Blood pressure, 104 to 110 systolic, 65 to 70 diastolic. The blood Wassermann was repeatedly negative, cerebrospinal fluid three to five cells to the c. m., globulin negative. Provocative arsphenamine given on November 4, 1920, and subsequent examination of the blood and cerebrospinal fluid was also negative. Gastric content (Ewald test meal) total acidity 24, free acid 8, no blood, no lactic acid, no Boas Oppler bacilli. Chest puncture. November 4th, in the area just below right angle of the scapula, needle had to be introduced about three inches, yet a small quantity, about four c. c. of yellowish purulent material was withdrawn, culture of which revealed the presence of influenza bacilli and Micrococcus catarrhalis. Another chest puncture on the 8th of November, about five c. c. of thick, yellowish round pus was withdrawn, which was examined for tubercle bacilli with negative results, but showed the presence of the other organisms. Guineapig inoculation of the sputum for tuberculosis was negative.

The patient was radiographed on October 16th and November 4, 1920, and the following report was submitted by the röntgen ray department—"Combined fluoroscopic and radiographic examination shows: The median half of the lower two thirds of the right lung field occupied by dense white homogenous ovalshaped shadow. This shadow is well circumscribed and shows slight pulsations, evidently transmitted from the heart. The shadow moves slightly with respiration. The heart and upper part of the aorta are of normal appearance and so is the left lung. These findings could best be explained on the basis of a lung abscess. A cyst is less probable. Neoplasm may, for practical purposes, be excluded."

COMMENT.

This type of chronic pulmonary abscess, i. e., one lasting about a year, with a severe productive cough and with large quantities of odorless sputum is infrequent. I was unable to find any detailed report of a similar case in literature. Hedblom (1), in a rather complete report of cases of pulmonary abscess from the Surgical Division of the Mayo Clinic since 1910, mentions cases of chronic pulmonary abscess where the sputum was nonodorous. In the other report of cases of chronic abscess of the lung that I was able to find the sputum was, as a rule, foul or of a disagreeable, sweetish (fruity) odor.

As to the etiology of chronic abscess, it follows rather closely that of acute abscess. Operations on the mouth, nose and throat, especially tonsillectomies, easily occupy a position of first importance as causative factors. The cases reported by Manges (2), Bevan (3), Clayton (4), Tewksbury (5), Frank

(6) and others were all apparently due to tonsillectomy. Next in frequency in the etiology of lung abscess must be mentioned the pneumonias, especially bronchopneumonia. Holt (7), Hedblom (1), Lord (8), Hartwell (9), Deaver (10), Brayton (11), emphasize pneumonia as a cause.

Among other causes Wessler (12) and Jackson (13) report many instances following foreign body aspirated into the lungs. Contiguous suppuration, especially encysted empyema rupturing into the lung and liver abscesses rupturing into the lung, occur but are rare. Hall (14) reports three cases of chronic lung abscess following neglected appendicitis, probably due to extension from the liver. The right lung seems to be more frequently affected than the left, regardless of the etiological factor.

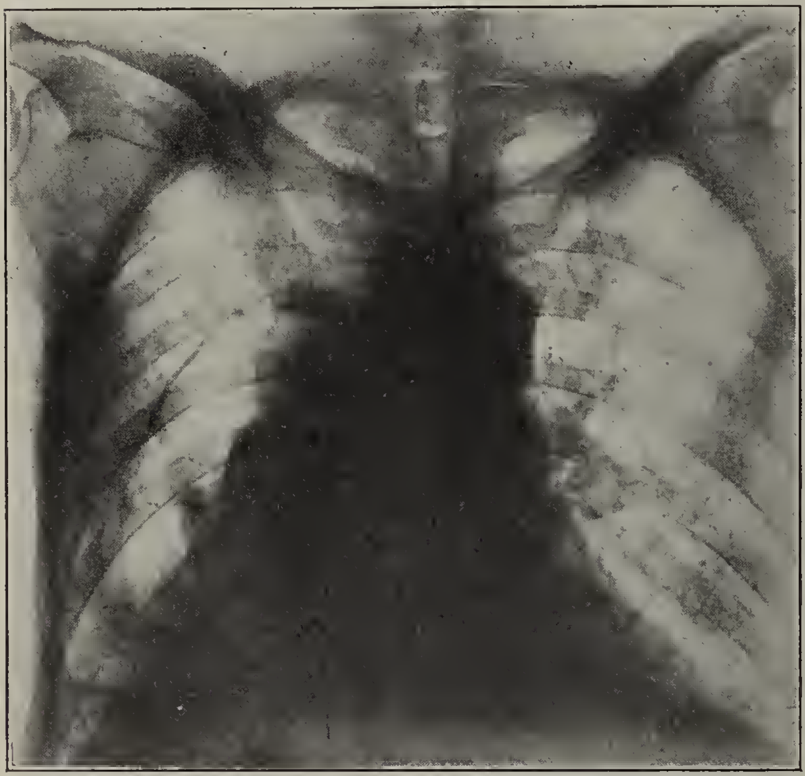

FIG. 2.—Shows thick fibrous wall of abscess cavity with wash of fluid gone.

In reference to the symptomatology the presence of an increasingly severe, productive cough, together with weakness, usually associated with symptoms of fever, such as chills or chilly sensations, with languor and anorexia, with loss of weight and pain in the chest, may be said to be more often present than not. The cough and the large quantities of malodorous sputum are the most constant of the symptoms. In my case there was also dyspnea and marked weakness and loss of weight, with vague pains in the right side of the chest—but the sputum remained odorless.

The only constant physical sign, judging by the reports in the literature, is dullness to percussion. Other signs, such as changes in the respiratory murmur, râles or signs of a cavity, may be present, but usually are not (except late and only in a number of the reported cases).

The diagnosis is usually not difficult when the abscess ruptures early in the course of the disease as it usually does, giving rise to the characteristic sputum. In cases where no such rupture occurs or when the sputum is not characteristic there may be considerable difficulty in arriving at a diagnosis. The conditions with which chronic pulmonary abscess may be confused are chronic tuberculosis and capsulated empyema, bronchiectasis, neoplasm and brokendown gumma of the lung and actinomycosis.

SUMMARY.

The following points should be considered in the diagnosis:

1. A history of either tonsillectomy or other nose and throat operation, or an anteceding pulmonary infection, especially bronchopneumonia (influenzal).
2. A progressively severe cough with large quantities of malodorous sputum, containing pus cells and yellow elastic fibres, but not containing tubercle bacilli, ray fungus or spirochetes.
3. General evidence of infection, such as irregular fever, weakness and loss of weight, prostration, associated with dyspnea to a varying degree, pleuritic pains and leucocytosis.
4. Signs of dullness and diminished breathing in one of the lower lobes, usually the right, with or without changes in the respiratory murmur and râles.
5. X ray finding of a circumscribed area of parenchymatous lung destruction.
6. Aspiration in doubtful cases and the examination of the aspirated fluid or tissue.
7. Where a brokendown gumma is suspected a complement fixation of the blood and celebrospinal fluid and perhaps a therapeutic test should be employed.

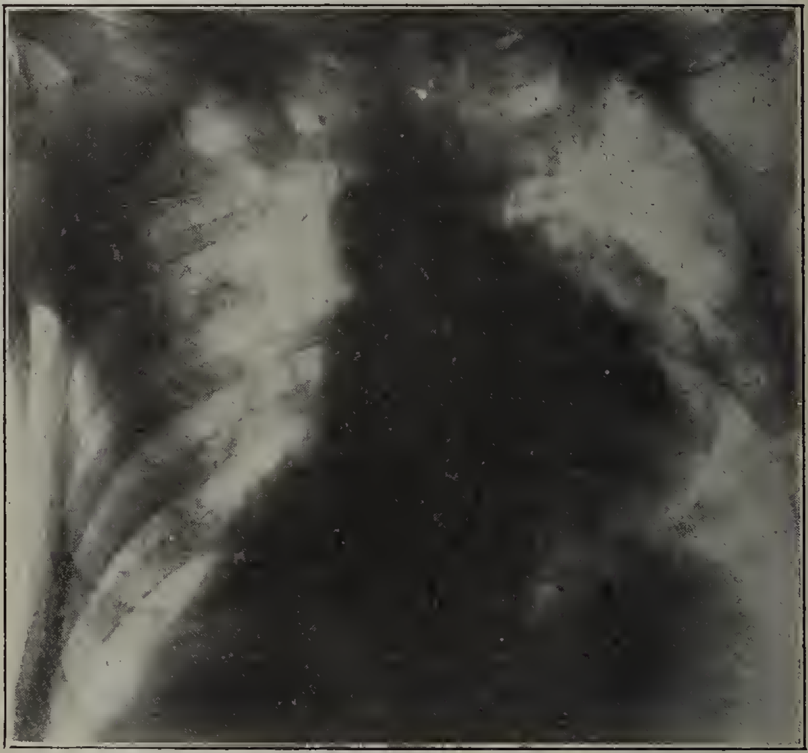

FIG. 3.—Shows same area of cavity formation filled with gas and fluid. Under the fluoroscope, the level of fluid could be seen to change in position with the change of position of patient.

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Weaning the Infant

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DEFINITION.

By weaning is meant the withdrawing of the breast milk and the substitution of stronger and other foods. Weaning should be done gradually whenever possible, and this gradual method should be adhered to, unless contraindicated, in justification to both mother and child. There are certain indications, however, which make it imperative that sudden weaning be instituted immediately. They are as follows: 1, Death of the mother; 2, failure of milk supply; 3, illness of mother, either acute or chronic, e. g., severe typhoid, pneumonia, tuberculosis or nephritis; 4, disease of the mammary gland; 5, when breast milk is attended by symptoms of indigestion, which are of sufficient import to cause continual failure to gain in weight and when every effort has been made to relieve this condition. Through many of the minor ailments, such as bronchitis, pharyngitis and indigestion, mothers have nursed their babies without any seeming detriment either to themselves or to their babies.

TIME REQUIRED FOR WEANING THE CHILD.

Ordinarily the time consumed in weaning the baby completely is from six to eight weeks. If the infant has had the benefit of one or two bottles daily from the sixth month and on, the task of weaning is comparatively simple. If, however, the infant has been kept on the breast exclusively up to the eighth or ninth month, certain obstacles will appear when weaning is attempted. The infant will not take the bottle if a breast is at its disposal, and the only way out of the difficulty is to deprive the baby of the breast and starve it into taking the bottle. This method exacts moral courage from both mother and doctor. Continued coaxing is objectionable and forcing is worse, as it only prolongs the struggle. A strong willed child will often hold out twenty-four to thirty-six hours, but at the expiration of this period of time the pangs of hunger are so keen that the infant surrenders and food will be accepted. Patience will ultimately conquer these stubborn little ones. In extreme cases, a few tube feedings may be necessary.

INDICATIONS FOR WEANING.

The appearance of the first incisors generally indicates that the time has arrived when the infant may pass gradually from the exclusive maternal diet to cow's milk and articles of food more solid. As a general rule, infants should not be exclusively breast fed after nine, or at most ten months, and since the early months of breast feeding are by far the most important, every effort should be made to have the mother nurse her child at least the first five or six months. It is not advisable to attempt weaning at the beginning of summer, even though we may be compelled to keep the infant at the breast a little longer, and if the infant at this time is getting a mixed feeding (breast and bottle) it should not be deprived of the breast entirely during the summer season.

TECHNIC.

At first one breast feeding should be substituted for a bottle which contains a modification of cow's milk, as nearly similar to mother's milk, as possible. (For very young infants, in sudden weaning, whey mixtures are usually best.) The infant is kept on this bottle formula of modified milk for three or four days, or even a week; should no disorders of digestion follow, another substitute bottle is given for the same period of time. This procedure is continued until all breast feedings are replaced by bottle feedings.

At this time we increase the quality of the mixture by adding milk and decreasing the content of water, until at the twelfth month, the infant is taking undiluted cow's milk. At this period, or a month or two later, the milk is fed with a spoon, or taken from a cup. Toward the close of the first year, a variety of foods may be offered, such as thick gruels of barley, farina, granum, rusk, well cooked rice, and oatmeal, beef juice, broths, zwieback, crackers, bread and milk.

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Editorial Articles

ECTOPLASM.

A blending of science and phantasy, one supplementing the other so as to make a more perfect creation, is rare. Conan Doyle, physician and writer of fascinating fiction, would nearly fulfill the requirements. Recently he has had much to say about a tenuous substance, elusive, a product of spiritists. This material has been given the highly scientific term of ectoplasm. A colyumist wag of one of our metropolitan dailies suggested that it might be a good trade name for a furniture glue, but surely Conan Doyle is serious, for he has lectured about this substance before groups of adults and told how it could be photographed. There are one or two important points in the actual *accouchement* of this mysterious material which leave some doubt among the more critical of the medical profession, but we will ignore these for the moment. We will also disregard the duplication of these phenomena by clever magicians who worked under circumstances less favorable than those of the more sincere demonstrators. We will concern ourselves only with some material which the gifted writer presented some ten years ago under the guise of fiction. This material, according to the evidence presented, seems to fulfill the requirements of rigid scientific investigation far more than that of ectoplasm. As is so frequently the case with men who mingle science with phantasy, there is always a possibility that the findings of one sphere will by chance be presented in the other. The following excerpts are taken from what A. Conan Doyle called *The Horror of the Heights*, a lurid title, the story appearing in the book called *Danger* (New York: Doran): "But soon my attention was drawn to a new phenomenon—the serpents of the outer air. These were long, thin, fantastic coils of vaporlike material, which turned and twisted with great speed, flying round and round at such a pace that the eyes could hardly follow them. Some of these ghostlike creatures were twenty or thirty feet long, but it was difficult to tell their girth, for their outline was so hazy that it seemed to fade away in the air around them. These air snakes were of a very light grey or smoke color, with some darker lines within, which gave the impression of a very definite organism. One of them whisked past my face and I was conscious of a cold clammy contact. ". . . Floating downwards from a great height there came a purplish patch of vapor, small as I saw it first, but rapidly enlarging as it approached me, until it appeared to be hundreds of square feet in size. Though fashioned of some transparent, jellylike substance, it was none the less of much more definite outline and solid consistence than anything which I had seen before. There were more traces, too, of a physical organization, especially two vast shadowy, circular plates upon either side, which may have been eyes, and a perfectly solid white projection between them which was as curved and cruel as the beak of a vulture. . . . On the upper curve of its huge body there were three great projections which I can only describe as enormous bubbles, and I was convinced as I looked at them that they were charged with some extremely light gas which served to buoy up the misshapen and semisolid mass in the rarefied air." There is more morphological description as well as an account of the behavior of this animal.

Now, we may ask, why does not A. Conan Doyle bring these creatures into evidence with his ectoplasm; they are far more interesting and the evidence he gives is far more convincing. They surely belong in the same category. Either the monsters should be classed with ectoplasm or the ectoplasm with the monsters. But to keep the monsters as copy for fiction and serve ectoplasm to the spiritistically inclined and attempt to give it scientific flavor is hardly fair to say the least. Let us add the monsters to the scientific by all means.

DEMENTIA PRÆCOX AND SYPHILIS.

Dementia præcox has been supposed, by not a few neurologists, to be due to either hereditary or acquired syphilis as these conditions have been found in the patients' antecedents, while from the clinical viewpoint the cases can be conveniently divided into two groups.

The first group is comprised of patients with the classical stigmata of hereditary syphilis; the second group comprises patients offering clinical manifestations analogous to those encountered in nervous syphilis, viz., unequal pupils, usually not very marked, with slow reaction, especially to light; disturbances of the tendon and cutaneous reflexes; temporary hemiparesis or monoparesis, ictus and a discrete lymphocytosis of the cerebrospinal fluid, as well as certain signs whose specific nature has only recently been proved, namely, onyxis, acroasphyxia, vitiligo, and Mikulicz's syndrome. To these may be added Argyll Robertson's sign. In the great majority of cases the progressive evolution of the mental disturbances end in complete dementia quite like psychoses due to syphilis, the only difference being that the evolution is much slower.

The cerebrospinal fluid in dementia præcox has been found to give rise to a positive fixation reaction. In a total of two hundred and sixty cases collected by Ensor it was present in eighteen and nine tenths per cent. and five times out of nineteen in Raviart's statistics. In some instances the only change in the cerebrospinal fluid has been a slight lymphocytosis (Poppea) or hyperalbuminosis (Muirhead).

As to the blood serum, it has been studied by Ivey who found the Wassermann positive in one female out of three and in two males out of twelve. Klutcheff and Soukhanoff obtained eighty per cent. positive reactions in subjects presenting luetic stigmata, while in those without them it was positive in only twenty-five per cent. Finally, Poppea, taking at random several cases of dementia præcox and having the serum examined by Danila and Stroe, found that it was intensely positive in nine, positive in five and weakly positive in two. Three cases were positive to a single procedure and one was negative, that is to say, ninety-five per cent. of positive reactions, while in seven instances in which the reaction was doubtful or negative these observers obtained a positive reaction following activation by Milian's procedure.

At the autopsy of a subject who had appeared to have general paresis, Laignel-Lavastine and Barbé found an encephalitis of the neuroepithelial type. All these data may seem *a priori* to be of mediocre value, because it is exceptional to find a history of hereditary or acquired syphilis in the patient's antecedents and as far as the socalled stigmata of syphilis are concerned we know at present that they cannot all be regarded as pathognomonic.

A certain number of cases of cerebral syphilis or general paresis have for a time evolved with the appearance of dementia præcox, and even supposing that the results obtained by a Wassermann reaction are undeniable, it nevertheless remains to be shown that in cases of dementia præcox in which it was positive in the cerebrospinal fluid that the process is not a general paralysis of the insane. The interpretation is still more delicate when the reaction is only positive in the blood serum and cases are not wanting in which it was negative and in all the patients examined by Babonneix, Brissot and David their clinical and serological researches invariably gave negative results.

From what is at present known we do not believe that one should conclude that syphilis plays no part in the development of dementia præcox. The subject requires a more methodical study than it has yet received. Supposing that from future statistics it will be shown that syphilis does intervene in the process under consideration, it will still be necessary to determine in what manner it acts, whether directly in the nervous system or indirectly by the intermediary of some endocrine gland.

THE HEART AND RESPIRATORY SYSTEM IN SCARLET FEVER.

Although there is little to add to the classical description of endocarditis and pericarditis complicating scarlet fever, that of myocarditis and cardiovascular disturbances has been of late considerably enriched.

Scarlatinal endocarditis is rare—according to Broadbent's statistics of 1907 it was only fifty-eight hundredths per cent. It occurs with or without rheumatism, is usually mild, but frequently gives rise to a chronic valvular lesion. It can be easily overlooked, as the functional symptoms to which it gives rise are usually unimportant. Septic ulcerating endocarditis is rare and usually ends in death. Pericarditis may exist alone or be associated with dry serofibrinous or purulent endocarditis; it is prone to be latent and retrogresses rapidly, but if purulent, death is likely to occur.

As to the functional disturbances of the myocardium, there is tachycardia usually at the onset and the older writers insisted upon this symptom as a good diagnostic sign of scarlet fever. The pulse rate varies from one minute to another and there is a marked arterial hypotension as well, but instead of tachycardia there may be a relative or absolute bradycardia, although in children this is not frequent. Bradycardia is met with rather constantly at the end of the phase of pyrexia, taking the place of the tachycardia. It lasts for eighteen to twenty days, is of nervous origin, is total, and without auriculoventricular dissociation. Various types of arrhythmia, as well as other changes in the pulse, are met with.

The blood pressure is low in the malignant syndrome of the disease in question and adrenalin exercises a favorable influence. On the other hand, there is hypertension with the acute nephritis of scarlet fever which retrogresses slowly even when the other symptoms of the renal process have disappeared.

There exist two syndromes which, for that matter, may be combined: First, the myocarditic syndrome which does not always depend upon lesions of the myocardium, being often due to extracardiac causes, especially changes arising in the suprarenals; and secondly, cardiac disturbances due to nephritis. These are often early in appearance and predominating, so that the patient seems to be a cardiac rather than a renal subject, presenting edema, enlarged liver, scanty albuminous urine, a small, frequent, and irregular pulse and an enlarged heart with a *bruit de galop*. In the subacute types all these symptoms are attenuated but become intense if the nephritis becomes chronic. As to the treatment of these cardiac complications it is the same as in other cases of endocarditis and pericarditis.

The complications arising in the respiratory tract in scarlet fever, other than purulent rhinitis, pleurisy and empyema, are hardly mentioned in textbooks. Cases of serious pseudocroup due to the streptococcus have been recorded, intubation being rendered difficult on account of spasm, while a reflex may start from the irritated larynx inhibiting the cardiac contractions, hence syncope, sometimes ending in death. Bronchopneumonia is not uncommon in the more serious cases of the disease, while instances of lobar pneumonia have likewise been encountered.

The predilection of scarlet fever for the serous membranes and fibrous tissue has long been known, hence pleural collections develop in the rheumatismal processes of the affection with or without endopericarditis. A streptococcal or pneumococcal pleurisy is also known to occur. Finally, as an intercurrent complication, acute pulmonary tuberculosis or tuberculous pleurisy may ensue, but scarlet fever is not a tuberculigenous disease, therefore these complications are uncommon.

VISUAL DISTURBANCES DUE TO QUININE.

Coutela and Daban (*Archives médicochirurgicales du Province,* December, 1921) call attention to disturbances of sight following the absorption of the salts of quinine. Although far less frequent than tinnitus aurium, for example, these disturbances should not be overlooked. The necessary dose for the production of these disturbances varies extremely, and although cases are reported following the ingestion of ten grams in twenty-four hours in a child of six years, of eighty grams in three days or after a single dose of twenty grams, they have been known to occur after a dose of one gram, twenty-five centigrams or even seventy-five centigrams. Nevertheless, it has usually been after large doses have been absorbed for producing abortion or with suicidal intent that disturbances of the sight have been noted.

Both eyes are involved about equally, the disturbance usually manifesting itself a few hours later, but in some cases they develop late when the total quantity of quinine absorbed during a cure is important. The patient notices that vision progressively diminishes, central vision being the last to disappear, preceded by a progressive loss of the peripheral visual field. Blindness, which generally ensues within a few hours, lasts anywhere from a day or two to eighty-four days. It ceases little by little, the central vision being the first to return, then the visual field enlarges horizontally, more on the temporal than on the nasal side, while the vertical vision improves more slowly and tardily. Central scotoma is rarely present. Spontaneous amelioration is the rule and only a few instances of permanent blindness have been recorded and seem to constitute exceptional cases. Both pupils during this time are in a state of maximum dilatation, the iris being reduced to a thin line. When sight has returned the pupils frequently remain immovable for some time.

By the ophthalmoscope the papilla is white, opaque, sometimes swollen, with slightly irregular edges. The chalky whiteness, which is striking, persists, while the edges become precise and visual acuity improves. The retinal vessels are remarkable for the considerable decrease of their calibre. Bollack has noted arterial hypertension in them. The macula may be cherry red and some observers have referred to small white brilliant spots with indistinct edges situated in the juxtapapillary and paramacular regions at the level of the posterior pole.

The prognosis is not as bad as might be expected from the intensity of the disturbances at their onset, but it can be affirmed that permanent blindness is exceptional. The diagnosis is made from the anamnesis and the coexistence of auditory disturbances. The great mydriasis, the bilaterality of the disturbance, and the ophthalmoscopic findings are sufficient data for making a diagnosis. One must not confound the clinical disturbances with visual complications which may accompany certain affections requiring treatment with quinine. It is a matter of prudence to ascertain if no other factor exists besides the intoxication by the alkaloid. When once the diagnosis has been made, an attempt should be made to eliminate what quinine may still be present in the digestive tract by the use of an emetic or a purgative, according to circumstances. The vasoconstriction of the optic vessels should be dealt with by inhalations of amyl nitrite. On the other hand, an attempt should be made to increase the afflux of blood by placing the head in a declivous position or the exhibition of ocular hypotensors, such as pilocarpine or eserine. Both massage and galvanization appear to be of little or no value. Rest in bed with good feeding is essential, while strychnine seems to be indicated to stimulate the nervous system. Caffeine is, on the other hand, contraindicated, because it increases the narrowing of the retinal vessels.

THE UNMARRIED MOTHER

Sociological workers continue to lament, and justifiably, that, in comparison with the advanced standards of some of the European countries, the few laws of our more progressive states showing a recognition of the illegitimate child as a socially valuable individual look painfully inadequate. The studies of the Boston Conference on Illegitimacy, 1914, report some astonishing facts, particularly as to the amount the father is required to contribute to the support of the child. In Illinois he must give $550 during the first five years of the child's life; in Tennessee, he gives $40 the first year, $30 the second, and $20 the third; and so on through many states. No wonder that, to quote Miss Breckinridge in her *Social Control of Child Welfare,* "the situation was so desperate that physicians, social workers and relatives have conspired to save the girl's respectability at the risk of the child's life and at the cost of all spiritual and educative value of the experience of motherhood. This has meant a greatly higher death rate among illegitimate infants, a higher crime and a higher dependency rate." Up to the time of the war the illegitimate child was never anything but the visible symbol of its parents' sin, and as such the bearer of the heaviest burden of the crime. The manner of its birth, not its eugenic value, was the only concern of society. Only the desperate situation created by the war and the consequent need for men was able to open, to a certain extent, people's eyes. The United States was, of course, less affected in this way than the European countries, consequently we are slow in awaking to the true aspect of the problem.

This awakening is taking place, nevertheless, as is evidenced in various ways. One is the more broadminded attitude toward unmarried mothers on the part of various institutions making a specialty of caring for them during pregnancy and recovery. A special point is made of this attitude in a recent report of one of these institutions. The erring young women are no longer looked down upon as moral outcasts, nor incriminated as delinquents, nor even patronized as pathetic weaklings, fit objects for the bestowal of charitable sentimentalities. Be it said, however, that the institution whose attitude is quoted declares emphatically and repeatedly that none of the types mentioned above are accepted as patients; these are limited to girls of the better class who have made a single misstep. Nevertheless, it is something to have arrived at a stage of socialmindedness which can recognize that even such transgressors are usually ignorant or more sinned against than sinning. The transgression is by no means condoned, but emphasized as a starting point for a new and stronger life and character. The young mother usually returns to her home community, "stronger than she would likely have been otherwise," and resumes her life, its one dark spot an eternal secret. The child is well placed by the institution in a home where it will receive good care from foster parents, often in better circumstances than the family from which its real mother comes. It will be seen from this that the institution in question does not agree with the sociological theory that this procedure tends to obscure the whole problem. The institution claims that, by its method of handling and treatment, the young woman is not forced to marry an unloved man, neither must she hide in some large city and try to support her child and herself, usually with great hardship to both, nor must she face disgrace for herself and her baby by returning to her home town and trying to live down her error. It is admitted that this is only the best way out of a bad situation—and perhaps it is, as conditions are now. But it surely is not the way to make society realize its mistakes and shortcomings, nor to force it to take steps to remedy conditions under which such things can occur. One of the most important of these steps would be to make provision for better education in sex matters for our boys and girls.

NEW MEDICAL SCHOOL AND HOSPITAL AT PEKING.

A review of the activities of the Rockefeller Foundation for 1921 contains an interesting account of the opening of the new medical centre in Peking. The report says: "On September 19, 1921, in the capital of China a unique academic procession made its way through oriental corridors and courts to an assembly hall which in its exterior form and decorations reproduced the classic features of Chinese architecture. The cortège was a blending of East and West, Chinese officials and other leading citizens, some of them in national dress, members of the diplomatic corps, distinguished guests in the variegated, brilliant gowns and hoods of European and American universities, the officers, trustees and faculty of the Peking Union Medical College, all in academic garb, made a striking and symbolic picture. Brief words of greeting and appreciation from representatives of the President of China, the cabinet, the medical profession, and educational institutions, a statement by the director of the China Medical Board, an address on the aims and spirit of the college by the chairman of the board of the Rockefeller Foundation, and the institution in its new setting and with enlarged resources was rededicated to the service of the Chinese people. These simple ceremonies were one session of a program which extended over an entire week and included daily clinics, scientific papers on medical and public health themes, popular evening addresses, sightseeing excursions, etc. . . . It was really an international congress of curative and preventive medicine. The clinics and papers were rated by competent judges as highly scientific and significant. The contributions of the members of the Peking faculty made a most favorable impression upon the visiting scientists."

The buildings of the college have both architectural beauty and practical serviceability. There are many laboratories and lecture rooms, a hospital of 225 teaching beds, and an outpatient department. The plant covers an area of about twenty-five acres and comprises a total of fifty-nine buildings. These include all the housing facilities, water supply, sewerage, electric light and gas services of a modern community. On June 30, 1921, the teaching staff numbered sixty-seven, of whom seventeen were instructors in the premedical school. About twenty-five per cent. of the teaching corps were Chinese, for the most part trained in the United States or Europe. Besides the educational personnel were fifteen interns and residents, twenty-eight nurses, and members of business and administrative departments. The service group of assistants totalled 601 and were practically all Chinese. The student registration for 1921-1922 showed fifty-two in the premedical school, twenty in the medical school, and eleven in the nurses' training school.

"The college seeks quality rather than quantity. It aims not to turn out numerous doctors—Chinese institutions must assume this task—but to train leaders who may serve as teachers and investigators in Chinese medical schools, hospitals and health organizations. In its own work it proposes to develop Chinese teachers, who already constitute twenty-five per cent. of the teaching staff, and to give them increasing rank and responsibility as rapidly as they are prepared to assume them."

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News Items.

Dr. Sajous Receives Gold Medal.—Announcement is made that the 1922 American Medicine Gold Medal has been awarded to Dr. Charles E. de M. Sajous, of Philadelphia, for his noteworthy contributions to the study of the glands of internal secretion.

Openings for Junior Medical Officers in Government Service.—The United States Civil Service Commission states that there is urgent need for eligibles to fill positions of junior medical officer in the Indian Service and the Coast and Geodetic Survey and that the commission will receive and rate applications until further notice. Full information concerning salaries, etc., and application blanks may be secured from the United States Civil Service Commission, Washington, D. C.

American Therapeutic Society.—Officers to serve for the ensuing year were elected as follows at the annual meeting held recently: Dr. Charles G. Jennings, of Detroit, president; Dr. Hermon C. Gordinier, of Troy, N. Y., first vice-president; Dr. Arthur Parker Hichens, of Washington, D. C., second vice-president, and Dr. C. E. Cooper-Cole, of Toronto, Can., third vice-president; Dr. Lewis H. Taylor, of Washington, D. C., secretary, and Dr. Spencer L. Dawes, of New York, treasurer.

Personal.—Dr. Frederick C. Warnshuis, of Ann Arbor, Mich., received the honorary degree of Doctor of Science for work in surgery, public health conservation and medical organization, from Hope College, Holland, at its fifty-seventh annual commencement.

Dr. Jacob Sobel, assistant director of the bureau of child hygiene of the New York City Department of Health, is retiring after serving the city for twenty-three years. More than one hundred physicians and surgeons of New York City honored him at a testimonial dinner on June 21st. Dr. Sobel is planning to study diseases of children with Professor Pirquet in Europe.

Dr. Bowman Crowell, who for the past four years has been head of the department of pathology in the Oswaldo Institute for Medical Research in Brazil, arrived in New York on June 27th. Dr. Crowell has made a particular study of Chagas disease, which is a kind of sleeping sickness endemic throughout the interior of Brazil. He has come to the United States to become professor of pathology and experimental medicine in the University of South Carolina.

Dr. Edward A. Spitzka was appointed District Medical Officer, Second District, United States Veterans' Bureau, on July 8, 1922. The Second District embraces the states of New York, New Jersey and Connecticut.

Dr. Charles H. Frazier, who was formerly professor of clinical surgery at the University of Pennsylvania, has been appointed by the board of trustees of that institution, the John Rhea Barton professor of surgery, to succeed Dr. John B. Deaver, whose resignation takes effect at the end of the college year.

Dr. J. H. Mason Knox, Jr., of Baltimore, has been appointed chief of the state bureau of maternity and child hygiene, a bureau created at the last session of the legislature under provisions of the Sheppard-Towner Act. Dr. Knox is at present directing child hygiene work for the American Red Cross in Europe.

Dr. T. Caspar Gilchrist, of Baltimore, sailed for England recently and will spend several months traveling abroad. He was scheduled to deliver the annual address before the London Dermatological Society on July 13th in London.

Dr. Stuart L. Craig, of New York, sailed for Europe on the *Majestic,* Saturday, July 8th. Dr. L. Webster Fox, of Philadelphia, sailed for Europe on the *Baltic,* Saturday, July 8th; also Dr. Edward Randall, professor of therapeutics, University of Texas Medical School, and Dr. John C. Boyd, of Washington, D. C.

Dr. Charles E. Farr, of New York, has been elected president of the Yale Medical Alumni Association.

Dr. Alec N. Thomson, of New York, has been appointed to the staff of the Committee on Dispensary Developments of the United Hospital Fund. Dr. Thomson is director of medical activities of the American Social Hygiene Association.

Dr. Irving S. Haynes was tendered a complimentary dinner by the medical board of the New York Athletic Club, following his retirement from active service at the Horlem Hospital.

American Psychiatric Association.—The annual meeting was held in Quebec, Canada, June 6th to 9th. Officers for the coming year were elected as follows: President, Dr. Harry W. Mitchell, of Warren, Pa.; vice-president, Dr. Thomas W. Salmon, of New York, and secretary-treasurer, Dr. Clarence Floyd Haviland, of Albany, N. Y.

American Neurological Association.—At the annual meeting held in Washington, D. C., the following officers for the ensuing year were elected: President, Dr. Harvey Cushing, of Boston; vice-presidents, Dr. Herman H. Hoppe, of Cincinnati, and Dr. Charles S. Potts, of Philadelphia; secretary-treasurer, Dr. Frederick Tilney, of New York.

Annual Meeting of Canadian Medical Association.—Dr. David H. Arnott, of London, Ont., was elected president at the annual meeting held at Winnipeg, June 20th to 23d. Other officers elected were as follows: Dr. Walter L. Muir, of Halifax, N. S., vice-president, and Dr. John W. Scane, of Montreal, Que., secretary. The association appointed a committee to report at the next session on the desirability of establishing a college of surgeons in Canada.

Addition to Broad Street Hospital Opened.—The new eleven story addition to the Broad Street Hospital was opened on June 19th. There are accommodations for one hundred patients and the several floors are financed by various groups; for instance the Grand Lodge of the State of New York finances the Masonic Floor; the seventh floor will be known as the Roosevelt Memorial floor for children, and will be financed by William Hamlin Childs. Mrs. James Barber will finance another floor, which will be known as the Nora Nickle Barber Maternity floor. Every business firm south of Chambers Street will be asked to contribute a stated sum annually for the maintenance of the hospital.

New Public Health School at Columbia University.—An institute of public health has been established at Columbia University, an undertaking made possible by the bequest of the late Joseph R. DeLamar, the executors of whose estate have given the university $777,772.45 for its school of medicine. The work of the new institute of public health will be chiefly research and the training of research workers; it will also give instruction to medical students and others, and will undertake giving wide publicity in a popular form to the findings of scientific investigations—this latter activity being stipulated by the will of Mr. DeLamar. The new office of professor of public health and administration will be filled by Dr. Haven Emerson.

Sanitary Science Exhibit in Washington.—A National Committee on Exhibits Showing Advances in Sanitary Science was formed recently in Washington, D. C., for the purpose of collecting and preparing material for a great popular health exhibit. Space for this exhibit has been placed at the disposal of the committee by the Smithsonian Institution. The members of the committee include: Surgeon General H. S. Cumming, United States Public Health Service, chairman; Dr. D. B. Armstrong, National Health Council; Miss Mabel T. Boardman, American Red Cross; Surgeon General M. W. Ireland, United States Army Medical Corps; Dr. Victor C. Vaughan, National Research Council; Dr. C. D. Walcott, Smithsonian Institution; James A. Tobey, secretary.

Faculty Changes in the Harvard Medical School.—Leonard T. Troland, who has served six years as instructor in psychology, has been promoted to the post of assistant professor. Dr. Reginald Fitz, who has served during the last two years as professor of medicine at the University of Minnesota, has been named as associate professor of medicine at Harvard. Other appointments in the faculty of medicine include Dr. Edward P. Richardson, as assistant professor of surgery; Dr. Jacques Bronfenbrenner, as assistant professor of bacteriology; Dr. Alice Hamilton, as assistant professor of industrial medicine; Dr. George C. Shattuck, as assistant professor of tropical medicine; Dr. David Cheever, as assistant professor of surgery; Dr. Lloyd D. Felton, as assistant professor of preventive medicine and hygiene; Dr. James L. Gamble, as assistant professor of pediatrics; Dr. James S. Stone and Dr. John Homans, as instructors in surgery, and Dr. William H. Smith and Dr. Frank H. Hunt, as instructors in medicine.

Italian Congress of Radiology.—The fourth congress of Radiology was held in the Rizzoli Orthopedic Institute, Bologna, on May 10th and 11th, under the presidency of Professor A. Busi. An interesting program was presented, among the subjects discussed being the therapeutic application of radiophysical principles, the radiological study of the digestive apparatus, deep x ray therapy, and the x ray treatment of malaria. During the congress an exhibition of radiological instruments was held. Officers to serve for the next two years were elected as follows: Professor Senator O. Corbino, of Rome, honorary president; Professor Bertolotti, of Turin, president; Professor Balli, of Modena, vice-president; Professor Ponzio, reelected secretary-teasurer. The fifth congress will be held in Palermo in October, 1923.

Changes in Medical Faculty of University of Georgia.—Five new appointments of professors for the medical department have been made. Dr. Eliot R. Clark, coming from the University of Missouri, will be professor of anatomy; Dr. Richard V. Lamar will be professor of pathology; Dr. Virgil P. Sydenstricker, from Augusta, will be professor of medicine; Dr. Ralph H. Chaney, from Rochester, Minn., will be professor of surgery, and Dr. Harry B. Neagle, from Adrian, Mich., will be professor of preventive medicine and hygiene. All the members of the present faculty were reelected. At the annual commencement exercises it was announced that the Rockefeller Foundation, the Carnegie Foundation, and the city of Augusta, Ga., have given the university $40,000 a year.

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Died.

Knox.—In Santa Barbara, Cal., on Thursday, June 29th, Dr. S. B. P. Knox, aged eighty-four years.

Mulcahy.—In New York, on Thursday, June 22nd, Dr. William L. Mulcahy.

Nichols.—In Boston, on Monday, June 12th, Dr. Edward R. Nichols, aged fifty-eight years.

Pettit.—In Hamburg, Germany, on board the U. S. SS. *St. Paul,* of which he was ship surgeon, on Wednesday, June 21st, Dr. Gaylor Joel Pettit, of New York, aged fifty-four years.

Wanless.—In India, where he was medical missionary, on Thursday, July 6th, Dr. W. G. Wanless, of Toronto.

Book Reviews

HAY FEVER.

Hay Fever and Asthma. Care, Prevention, and Treatment. By WILLIAM SCHEPPEGRELL, A. M., M. D., President, American Hay Fever Prevention Association; ex-President, American Academy of Ophthalmology and Otolaryngology; Chief of Hay Fever Clinic, Charity Hospital, New Orleans. Illustrated with One Hundred and Seven Engravings and one Colored Plate. Philadelphia and New York: Lea & Febiger, 1922. Pp. x-274.

The volume under review is one of the latest books published on this widespread and interesting disease. The book is illuminating from many points of view. In the first place the author is thoroughly familiar with his subject, both from the point of view of a well trained physician and of a well informed botanist. The earlier chapters of this very readable book are devoted to a thorough description of the various pollens which may be incriminated in the production of hay fever. The geographical distribution of these pollens is carefully gone into. The factors associated with their spread—wind, effect of temperature, rain and dust—are elucidated. Chapters IX and XI are devoted to a discussion of the various etiological factors, such as the influence of sex, occupation and race, in the production of hay fever and asthma. The steps in diagnosis, prevention and treatment are described in detail. The method of testing the wind pollination of hay fever plants, the collection and identification of atmospheric pollens, the relation of hay fever to the most common plants, trees and grains, are recorded most carefully and clearly. An interesting survey of hay fever resorts, in various parts of the United States and Canada, forms an important addendum, which will prove invaluable to the general practitioner as well as to the patient.

STOMACH AND ABDOMEN.

The Stomach and Abdomen from the Physician's Viewpoint. By WILLIAM RUSSELL, M. D., LL. D., ex-President Royal College of Physicians, Edinburgh; Professor Emeritus of Clinical Medicine, Edinburgh University; Consulting Physician, Royal Infirmary, Edinburgh; Author of *Arterial Sclerosis, Hypertonus and Blood Pressure,* and *The Sphygmometer.* New York: William Wood & Co., 1921.

Even the most sincere opponent of the knife in medicine must admit that the extension of the field of abdominal surgery to embrace practically every morbid condition within that cavity has greatly enlarged our knowledge of diseases of the abdominal organs. The author of this most practical treatise, while writing for physicians and treating of the conditions which can be dealt with by nonsurgical measures, frankly acknowledges the debt of the diagnostician to the abdominal surgeon, and expresses his preference for operative over postmortem diagnoses.

The book is divided into seven sections treating respectively of the stomach, the pylorus and duodenum, the intestinal tract, the esophagus, the liver, the spleen, and the kidney. Of course, the author does not regard every intraabdominal condition as belonging to the internist only, but he looks upon them all from the family physician's point of view, and not primarily from that of the operating surgeon. In the case of appendicitis, for example, he rejects the cruel advice to let the patient suffer acute agony, and refrain from giving opium lest the symptoms be masked thereby. He pays the surgeon the compliment of saying he could not conceivably be seriously misled by the mere relief of pain consequent upon the administration of opium, for the continual call for opium may be, and indeed usually is, an indication for operation. The author of the work is a man of ideas and of practical common sense as well, and he approaches his subject from both these sides, with the result that the reader has a book which he may read and consult often with advantage.

INSANITY AND FOCAL INFECTIONS.

The Defective Delinquent and Insane. The Relation of Focal Infections to Their Causation, Treatment, and Prevention. By HENRY A. COTTON, M. D., Medical Director, New Jersey State Hospital at Trenton; Lecturer in Psychopathology, Princeton University. With a Foreword by ADOLF MEYER, M. D., Director of the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital. Lectures Delivered at Princeton University, January 11, 13, 14, and 15, 1921. Princeton: Princeton University Press: London: Oxford University Press, 1921. Pp. xvi-201.

The work that Cotton has done in showing the relationship which exists between psychic and physical disturbances has certain points of value. The impression which has been caused by his assertions has proved detrimental. His enthusiasm no doubt has led him to make dogmatic statements which are beyond proof and which are distinctly not true. He has stressed the importance of physical causes of psychic conditions, but he has failed to see that these physical conditions were first caused by psychic disorders. It is not to be argued that an infection found in a patient suffering from a mental disturbance should be ignored. The defects in the organism should be corrected, infections removed and physical measures used to combat physical ailments. So far we are in accord. We can also agree with the statements of Cotton regarding the small rôle heredity plays in the etiology of mental disease, but when he is rash enough to say that "while psychogenic factors, when present, also exert an important influence, these may be absent and yet a psychosis develop," we must pause and check matters up. Were he viewing matters as they exist he would clearly see that there can no more be a psychosis without psychogenic factors than there can be chickens without eggs. Psychogenic factors may be pushed into the background by the removal of some disturbance, which, by lowering resistance, allows the formerly hidden conflicts to come to the surface, but they remain in the possession of the patient to emerge again in any stressful circumstance once the defense mechanism is lowered. It is only by bringing the psychic factors to the surface that the roots of the disease may be reached. We may well believe Cotton when he states that he has seen psychotic patients and has not noted the psychogenic factors, but his inability to see them does not eliminate them. They are always present. Workers in large institutions where thousands of patients are examined assert that they are present in every case, so it must be that Cotton in looking for foci has overlooked the mental and emotional factors which have been operating. He speaks of "worry, grief, shock and mental overwork" as mental factors. This shows that he does not include the many repressed mental conflicts which constitute the major portion of our psychic disturbances. He also attempts to cling to the archaic idea that mental disorders are disorders of the brain. He finds it difficult to grasp the broader terminology speaking of these disorders as those of the mind. Just what does he mean by the brain? Does he limit it to that mass of boxed up material covered with meninges? If so he is isolating himself on a dangerous island.

The weakness of any deductions that can be built up on an hypothesis in which as Cotton states that "heredity, environment, personality and psychogenic factors . . . may all be absent and a psychosis may develop" is apparent. It requires no comment to show the fallacy of such reasoning. A theory constructed along these lines can not be taken seriously.

COMPARATIVE ANATOMY.

A Laboratory Manual for Comparative Vertebrate Anatomy. By Libbie H. Hyman, Department of Zoology, University of Chicago. Chicago: The University of Chicago Press, 1921.

The author has prepared a useful and interesting work on the study of comparative anatomy in the dissecting room. Not only has the author given full directions for the dissection of the various systems discussed, but in connection with each system there has been incorporated a brief, generalized and simplified account of the development and evolution of that system. Numerous simple illustrations have been added to clarify the text, but the author has not intended that these explanations shall take the place of the reading matter. The result is a volume of unusual lucidity and interest, in a subject that usually constitutes difficult reading.

The print is excellent, the illustrations clear, both combining to make the book a very readable volume for those interested in this particular subject. We believe the average medical student would do well to familiarize himself with this and similar works, and thereby obtain a clearer conception of the human anatomy and its relation to the lower forms of life with which we are in such close contact.

THE MAYO FOUNDATION.

Papers from the Mayo Foundation for Medical Education and Research and the Graduate School of Medicine of the University of Minnesota. Covering the period of 1915-1920. Octavo Volume of 695 Pages, with Two Hundred and Three Illustrations. Philadelphia: W. B. Saunders Company, 1921

These papers summarize the research work done by the graduate students in the medical school of the University of Minnesota during the years 1915-1920. Many of them contain new material that must prove of interest both to the clinician and the investigator. Sixty-four papers thus have been contributed. The alimentary tract, the urogenital organs and the nervous system seem to have received most attention, but a careful reading shows that practically every department of internal medicine has been treated in these papers. There is an excellent bibliographic index and an index of subjects which is all that could be desired.

It is to be expected that a volume of papers of this kind will contain a preponderance of laboratory subjects; and this is perhaps the only criticism that might be offered, though the reviewer does not feel that such criticism would be justified in view of the wide range of subjects that have been considered. One cannot but feel that the publishers have performed a real service in collecting and presenting these papers and presenting them to the medical profession in their present attractive form. Anyone interested in the progress of medical thought will do well to read the papers contained in this volume.

RADIATION THERAPY.

The Principles of Physics and Biology of Radiation Therapy. By Bernard Kroenig, Professor of Gynecology and Obstetrics, University of Freiburg, and Dr. Walter Friedrich, Chief of Division of Radium Therapy, University of Freiburg. Only Authorized English Edition with an Appendix, by Dr. Henry Schmitz, Professor of Gynecology and Head of Department, Loyola University School of Medicine, Chicago, Ill. With Eighty-six Textual Figures and Twenty Colored and Eleven Black and White Plates and Thirty-two Tables. New York: Rebman Company, 1922. Pp. 271.

Radium Therapy. By Frank Edward Simpson, A. B., M. D., Professor of Dermatology, Chicago Polyclinic; Adjunct Clinical Professor of Dermatology, Northwestern University Medical School, etc. With One Hundred and Sixty-six Original Engravings. St. Louis: C. V. Mosby Company, 1922. Pp. 391.

Kroenig's work is truly a ponderous monograph, well planned, thoroughly investigated and logically organized. X ray dose is conceived of in terms purely physical and with this new physical unit the biological effects of radiation studied. The experiments recorded divide themselves into two distinct classes; those relative to the physics of radiation in which section unit dosage and its measurements are introduced and those pertaining to the biological effects of radiation. An appendix is added containing published papers by authors and collaborators on subjects pertinent to the contents of the book. This publication is worthy of the attention of all interested in a scientific approach to the problems of radiotherapy.

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Simpson's book is well written and profusely illustrated with photographs of the author's own cases. It is a concise presentation of our knowledge of radium boiled down to the last minute before going to press in March of the current year. There is a comprehensible and valuable bibliography but the author's statements and conclusions are well based on his own wide experience. Beginning with the discovery of radium, we are led to consider its chemical nature and physical properties, its constant decay into radium emanation—which can be used instead of the element itself—the Deburne-Duane-Failla apparatus for its preparation and the method of measuring its gamma ray activity. There follows an informing discourse on the absorption of the different rays, filtration and screening, and a lengthy chapter on the absorption of the gamma rays in water. Of the highest value is that section of the volume which treats of the biological effects of the rays, the therapeutic apparatus, dosage, reaction and technic of radiation. The author's discussion of the treatment of benign and malignant tumors and chronic infections is made easy of reference by division into chapters devoted to general surgery, gynecology, dermatology, eye, ear, nose and throat, and internal medicine with diseases of the ductless gland. All in all we have in this medium sized volume an important addition to the definite knowledge of the nature, properties and uses of radium. Its form is understandable, its material accessible, and its conclusions sincere.

POPULAR ENDOCRINOLOGY.

Glands in Health and Disease. By BENJAMIN HARROW, Ph. D., Associate in Physiological Chemistry, College of Physicians and Surgeons, Columbia University. New York: E. P. Dutton & Co., 1922. Pp. xiii-216.

The purpose of this book is difficult to determine. For medical men it has little value, but from the general presentation this does not concern the author, for clearly he wishes to educate the general reading public. While so much activity is going on in the field of endocrinology among scientific men and the subject is being exploited by commercial interests, it is natural for the general public to be interested in the subject. From this viewpoint the book is of service, the information presented is at least not inaccurate, although it cannot be utilized for anything constructive. All that can be said is that it is a general popular résumé of endocrinological material written to satisfy the curiosity of those whose interest in the subject has been stimulated by the vast amount of bosh which they have found in sensational periodicals.

SOCIAL PROBLEMS.

Society and Its Problems. An Introduction to the Principles of Sociology. By GROVE SAMUEL DOW, Professor of Sociology in Baylor University. New York: Thomas Y. Crowell Company, 1922. Pp. xiv-594.

A consideration of sociology from a conservative, retrospective point of view presented in a flat, unimpressive manner. The literature has been freely consulted and carefully pruned. The author's wishes are frequently used as bases for assumptions which do not coincide with reality. His intentions are of the best but the results tend to be misleading. Dogmatic assertions have advantages for teaching purposes, from the point of view of the teacher, but in a world where people may think independently of the pedagogue these same statements do not always "hold water." The material which is quoted could have been utilized for more substantial purposes.

GENETICS.

Genetics. An Introduction to the Study of Heredity. By HERBERT EUGENE WALTER, Associate Professor of Biology, Brown University. With Ninety-two Figures and Diagrams. Revised Edition. New York: The Macmillan Company, 1922.

An accurate yet popular presentation on heredity. This, the second edition coming ten years after the first, has filled the gap which the discoveries of workers in this field have created. For anyone who wishes to become conversant with the elements of heredity without delving into the more technical works this book may be highly recommended.

NEW CLASSICS.

Goethe's Faust. New York: Alfred A. Knopf, 1922. Pp. 572.

Les Contes Drolatiques. By HONORE DE BALZAC. New York: Alfred A. Knopf, 1922. Pp. 516.

It is needless to attempt a review of these two masterly classics. They appear as part of a series, issued by Knopf, in the original language. The workmanship on these books is excellent. They have been printed on fine paper, bound in limp cloth covers and made of a size convenient for the pocket. The form and appearance of the edition is extremely attractive.

FAMILIAL DIFFICULTIES.

The Ship. A Play in Three Acts. By ST. JOHN G. ERVINE. New York: The Macmillan Company, 1922.

A projected picture of a conflict between father and son in a setting of fantasy blended with a somewhat stolid reality. The age long struggle between the generations is brought up to date by the delineation of commercial achievement. Echoes of the war of a pessimistic yet true note come into the play. Four generations serve to bind the plot. The will to power, to rule, to dominate—especially the offspring, is definitely portrayed.

PATHOLOGICAL FICTION.

Rahab. By WALDO FRANK.. New York: Boni & Liveright, 1922. Pp. 241.

Rahab is the story of a woman who was apparently able to find no spiritual satisfaction in a life that did not include complete gratification of the sexual instinct. The wondering reader, instinctively attempting to rationalize or justify such a viewpoint, vaguely surmises that the author conceives himself as the inspired messenger to a puritanical Western world, proclaiming the wrongs inflicted by a prudish society upon women who desire to live their lives according to the dictates of nature. He seems to have no conception of the part played in life and character building and the attainment of spiritual values through the exercise of moderation and selfrestraint and selfcontrol.

The style of the book is futuristic; in other words, hectic, involved, bizarre and freakish to the extreme. "A quiet pain in the table and her words . . . a distant pain" is one thought. "It was Englished from the French," is another statement. "His beard was a grey prayer," is a third. Many passages are revolting in their unnecessary physiological details. If this Oriental frankness of *Rahab* consisted of a natural and spontaneous sensuality, such as that, for instance, of the unexpurgated form of the *Arabian Nights,* it might be excusable, but the book is permeated with a distinctly artificial and purposive salaciousness that makes it in many places disgusting reading. Minor faults are consistently misspelled words and numerous typographical errors.

The only favorable thing that can be said about it is that there are a few vivid descriptive touches and two or three bits of clever characterization; but these are so very few that they are negligible in providing any possible excuse for the perpetration of a work like *Rahab* by a writer of Mr. Frank's potential ability.

Medicoliterary Notes.

Reading matter for the long, daylight saving evenings, for weekends in the country, and for summer vacation periods should be not too "strenuous," yet interesting, and profitable—sometimes! Here are a few hints about some of the late books. Among novels in which the chief interest is character development are *Joanna Godden*, by Sheila Kaye-Smith; *Memoirs of a Midget*, by Walter De La Mare; *Intrusion*, by Beatrice Kean Seymour; *Maria Chapdelaine*, by Louis Hémon; and *The Life and Death of Harriet Frean*, by May Sinclair. Two novels of American life are *Beggars' Gold*, by Ernest Poole, and *Children of the Market Place*, by Edgar Lee Masters, well known as the author of the *Spoon River Anthology*. Mr. Masters is a better poet than novelist, however, for *Children of the Market Place*, really a history of the Middle West from 1833 through the early years of the Civil War, is rather prosy in spite of some vivid descriptions of episodes and a few good character studies, such as those of Lincoln and Douglas.

Others on phases of American life are *The Fair Rewards*, by Thomas Beer, a charmingly written story based on theatrical life in New York in the '80's; *Birthright*, by T. S. Stribling, an interesting, if inconclusive, discussion of the socalled negro problem; *The Vehement Flame*, by Margaret Deland, not at her best; *Gentle Julia*, by Booth Tarkington in his usual manner; and *Vandemark's Folly*, by Herbert Quick, a story of pioneer days. Good detective and mystery stories are *Within Four Walls*, by Edith Baulsir; *The Red House Mystery*, by Arthur Milne; *The Bright Messenger*, by Algernon Blackwood; and *The House of Souls*, by Arthur Machen, the last being four stories of the supernatural which will appeal to lovers of Poe, and of the uncanny tales of Hawthorne and Bulwer Lytton. The more serious minded will find well worth while Edwin Björkman's *Soul of a Child*, a study of child psychology in fiction form.

Among plays now available in book form are *Ambush*, by Arthur Richman, more interesting to see than to read; *He Who Gets Slapped*, presented this winter by the Theatre Guild; *Back to Methuselah*, by Bernard Shaw, also given by the Guild; *The Detour*, by Owen Davis; *Will Shakespeare*, by Clemence Dane, author of one of the greatest successes of the season, *The Bill of Divorcement;* and a new volume of Eugene O'Neill's plays including *Anna Christie*, *The Hairy Ape*, and *The Oldest Man*. A rather superficial but entertaining book including sketches of some of the well known British playwrights and actors is Hasketh Pearson's *Modern Men and Mummers*. Ludwig Lewisohn is the author of a critical volume entitled *The Drama and the Stage;* and *The No Plays of Japan*, translated by Arthur Waley, is a beautifully gotten up volume about the national Japanese drama.

Those interested in reconstruction problems in this country will find instructive a little book by Robert Mountsier called *Our Eleven Billion Dollars*, which discusses America's proper attitude to the allied debt from the point of view of the conservative American business man. Durant Drake, professor of philosophy at Vassar College, in *America Faces the Future*, takes up in turn what he considers our five national ideals—liberty, equality, democracy, efficiency and patriotism—and discusses in a sane, broadminded and practical manner the application of each to various contemporary problems.

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The June *Atlantic Monthly* contains several articles of unusual interest. The Flapper should feel honored to be discussed as a social and psychological phenomenon by no less an authority than Dr. G. Stanley Hall in an article entitled *Flapper Americana Novissima*. Gino Speranza has a paper on immigration and other present day problems in the United States. Vernon Kellogg in *Being Born Alike But Different* gives a popular dissertation on heredity. Ellen N. La Motte and Girja Shanker Bajpai contribute papers on the opium trade. Two interesting poems on Washington and Lincoln with the title *American Born* were written by Samuel Cohen, a boy in the Americanization School in Washington.

* * *

James Harvey Robinson has in the June *Harper's* an article *Is Darwinism Dead?* in which he states that we are in danger of taking too lightly our animal descent, rather than of emphasizing it unduly.

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New Publications Received.

ONE. By Sarah Warder MacConnell. New York: The MacMillan Company, 1922. Pp. 280.

L'EMPLOI DES RAYONS X EN MEDICINE. Par Dr. Paul Duhem. Paris: Ernest Flammarion, 1922. Pp. 303.

THE SECRET PLACES OF THE HEART. By H. G. Wells. New York: The MacMillan Company, 1922. Pp. 287.

TUMOURS INNOCENT AND MALIGNANT. By Sir John Bland-Sutton. Seventh Edition. New York: Paul B. Hoeber, 1922. Pp. x-806.

L'HYPERTENSION ARTERIELLE. Par les Docteurs Maurice Perrin, and Gabriel Richard. Paris: Librairie J. B. Bailliere et Fils, 1922. Pp. 109.

A TEXTBOOK OF CLINICAL PERIODONTIA. By Paul R. Stillman and John Oppie McCall. New York: The MacMillan Company, 1922. Pp. xvii-240.

A TREATISE ON GLAUCOMA. By Robert Henry Elliot. Oxford Medical Publication. London: Henry Frowde and Hodder & Stoughton, 1922. Pp. xxii-656.

X RAYS AND RADIUM IN THE TREATMENT OF DISEASES OF THE SKIN. By George Miller MacKee, M.D. Philadelphia and New York: Lea & Febiger, 1922. Pp. xi-602.

QUESTIONS NEUROLOGIQUES D'ACTUALITE. Vingt Conferences, Faites a la Faculte de Medecine de Paris, 1921. Introduction par M. le Professeur Pierre Marie. Paris: Masson et Cie, Editeurs, 1922. Pp. 551.

DISEASES OF THE DIGESTIVE ORGANS WITH SPECIAL REFERENCE TO THEIR DIAGNOSIS AND TREATMENT. By Charles D. Aaron. Third Edition. Thoroughly Revised. Philadelphia and New York: Lea & Febiger, 1921. Pp. 904.

A TEXTBOOK OF PRACTICAL THERAPEUTICS WITH ESPECIAL REFERENCE TO DISEASE AND THEIR EMPLOYMENT UPON A RADIONAL BASIS. By Hobart Amory Hare, M.D., LL.D., B.Sc. Eighteenth Edition. Philadelphia and New York: Lea & Febiger, 1922. Pp. xiv-1038.

THE MECHANISM OF THE BRAIN, AND THE FUNCTION OF THE FRONTAL LOBES. By Professor Leonardo Bianchi. Authorized Translation from the Italian by James H. McDonald. New York: William Wood and Company. Edinburgh: E. & S. Livingstone, 1922. Pp. 348.

Practical Therapeutics

ROENTGEN THERAPY OF DISEASED TONSILS AND THEIR ADNEXA.

By John Remer, M. D.,
and D. L. Satenstein, M. D.,
New York.

In this article there are no new principles of x ray therapy; only those which have stood the test of time are considered in this paper. Their application varies with the character and location of the pathological process. The character of the pathological process, whether inflammatory, granulomatous or neoplastic, determines the intensity of the exposure and the location the guide for the technic, i. e., the spark gap, milliamperage, distance, filters, and other details.

TYPE OF TONSILS.

Hypertrophied tonsils in consequence of repeated inflammation, resulting in hyperplasia of the lymph adenoid tissue, either with or without a proliferation of the connective tissue, which may or may not be permeated with leucocytes, are strongly predisposed to acute inflammations because different organisms find lodging places in the crypts. These serve as a favorable soil for their development and are points of entrance for metastatic inflammatory processes in the deeper tissue.

If the increase in the connective tissue is slight, the tonsil is soft; if great, the tonsil is hard almost like a fibroid tumor. All degrees are found. Associated with the tonsil changes, one frequently finds in varying degrees, similar changes in the surrounding mucous membranes and lymphoid tissues, so that there is nearly always a chronic pharyngitis with or without the involvement of the orifices of the eustachian tubes, and in a fair proportion of cases, adenoids and changes in the mucous membrane of the nasal passages. We must not forget the bed of tissue in which the tonsil lies and the lymphatic nodes and glands into which these diseased tonsils drain. We must not forget that the organisms present are elaborating toxins which are responsible for so many of the constitutional symptoms noted in cases of long continued inflammatory tonsils with acute exacerbations. The surface of the tonsils shows changes characteristic of this inflammatory process. The mucous membrane is thickened, the crypts dilated and filled with detritus, exfoliated cells, pus cells, and microorganisms.

TECHNIC FOR PREPARATION OF PATIENT.

In the treatment of tonsils, as in röntgen exposure for other conditions, it is important that no irritating liniment—iodine or any irritating ointment—be used for at least two weeks previous to x ray exposure, during the intervals between exposures, and for two weeks subsequent to the last exposure, nor should strong solutions of nitrate of silver be applied to the tonsils, either before, during or after exposure. During this period only bland applications are permissible. It is not advisable to make exposures during an acute inflammatory condition of the throat or tonsils.

POSITION OF THE PATIENT.

The patient is placed on his abdomen, the head on a sufficient number of supports so that the line of the spine is brought to the same plane and turned to the side resting on the opposite ear, chin tilted upward so that the ramus and angle of the jaw are drawn away from the neck. When this is done, some of the rests are withdrawn so that the head may drop about half an inch, in order to increase the distance of the angle of the jaw from the neck. We then have before us the site through which rays are passed down to and through the diseased tonsil, to the opposite tonsil and adnexa, that is, the bed in which it lies, the soft palate and posterior pharyngeal wall and the vault of the pharynx.

SITE OF EXPOSURE.

The site of exposure is an angle made by the ramus of the lower jaw as the anterior margin, the anterior border of the sternocleidomastoid muscle as the posterior margin, the tip of the mastoid process as the apex. Beneath this there are no bony structures: we have muscle and fat so that we have nothing practically that will filter out any of the rays.

SHIELDING THE PATIENT.

A sheet of lead foil or lead rubber, at least a sixteenth of an inch thick, with an opening three and a half inches long and two and a quarter inches wide, is placed so that the upper margin of the opening is just above the tip of the mastoid process and that the site of the exposure lies in the centre of the opening, care being taken to cover with sufficient lead so that the hair of the head, the shoulder and the neck are protected. This may be accomplished by having a single sheet of lead sufficiently large to cover all these parts.

RELATION OF TUBE TO EXPOSURE SITE.

Care must be taken, and this is most important, that the target (anode) is in such position that the rays will strike the exposure site and the diseased tonsil area at right angles. This position will vary with the patient.

INTENSITY AND FREQUENCY OF THE EXPOSURES.

As previously described, the pathological process is subacute or chronic in character. In an article published by us (1) we show that in order to call forth a response in chronic inflammatory tissue, it must be exposed to a minimum of one filtered unit every two weeks.

TECHNIC.

Employing a Coolidge tube and interruptless transformer, with the following factors, the tube placed at a distance of ten inches, a spark gap of seven inches, milliamperage five, a time of three minutes and nineteen seconds, through a filter of three mm. of aluminum (2), an exposure of one unit is obtained. These factors are those which we employ. Any other setting of the machine may be used, providing the time is changed so that by the formula used an amount equal to one filtered unit is the result. If, for example, a setting six inches spark gap five milliamperes and ten inches anode distance, with three mm. of aluminum filter were used, an exposure of three minutes and fifty-one seconds would be necessary. The patient is then turned to the opposite side and a similar procedure is followed.

THE AGE OF THE PATIENT.

The exposure given, i. e., one unit intensity filtered, is sufficient for the average adult. This must vary with the age of the patient and a less intensity administered to a young child.

CHARACTER OF THE SKIN.

We must consider whether the patient is blond or brunette, and whether we are dealing with a fine or a coarse skin. It is well known that there is likely to be a quicker and more prolongel skin response to the rays in blonds and that an erythema is more easily produced in this type of skin. Consequently, one must be extremely cautious in treating these patients.

RESPONSE OF THE CELLS.

Referring again to the article before mentioned (1) we find: "After a röntgen ray exposure, the resistance of all cells is influenced and their activity is proportionately affected. The more resistant cells recover in less time than those of less resistance. In the tonsil tissue exposed, there are the pathological round (lymphoid), connective tissue cells, and microorganisms. The lymphocytes are cells of least resistance, and are, therefore, more readily influenced. Ordinarily tissue characterized by the presence of lymphocytes is exposed to a quarter skin unit and they are so inhibited that little or none of their activity is recovered at the time of the second exposure. A varying degree of shrinkage of the swelling is noticed, and, as explained, it is at the expense of the lymphoid elements." We said, "If the intervals between the exposures are sufficiently long, all cells will recover." We therefore make a second exposure at the end of two weeks, i. e., before the connective tissue elements have had time to completely recover from the inhibition of their activity as the response to the first exposure. After a second exposure, the activity of the cells which have not fully recovered is more readily affected as their resistance has already been influenced. With each successive exposure the resistance is more and more influenced and the activity is less and less maintained. When the accumulated effect at the point of saturation is reached, the tissue affected becomes nonresistant and inactive and degeneration and involution set in. The rapidity with which this stage is reached depends upon the density and the amount of the connective tissue elements present in the inflammatory process, in or about the diseased tonsil.

After the second, third or fourth exposure, varying degrees of shrinkage of the hypertrophied tonsil are evident. The effect is not only in the visible tonsil but also in all the pathological tissue surrounding the affected tonsil. We have mentioned the presence of the microorganism and pus in the crypts and body of tonsil proper. One of the first evidences of the effects of the therapy is the general improvement of the patient; namely, those symptoms referable to the absorption of the toxin elaborated in the pathological area. It has been proven experimentally that after the second or third exposure the tonsils are sterile (2), that is, cultures from the crypts are negative and few or no pus cells are present.

EXPLANATION OF RESULTS OF EXPOSURE.

Laboratory experiments have shown that microorganisms do not ordinarily respond to x ray exposures. We know that microorganisms produce toxins at the expense of their environment, i. e., its culture medium, either in the test tube or the tissue in which they are lodged. We said that all cellular metabolism is inhibited following an x ray exposure. Not only the cellular metabolism in its normal function, but also the metabolism as the response to the organism present, i. e., toxin formation. As the action is more and more inhibited, following each successive exposure, less and less, or no toxins are produced, and a time comes when no more toxins can be produced. Less and less of this toxin is absorbed into the circulation, and the body circulating fluids, not having increasing amount of increasing virulence to contend with, are then capable of carrying out their functions, that is, to neutralize, or, better still, oxidize the toxin present, and at the same time functionate as a bactericide, thus paving the way for phagocytic action, which is always noted during the process of involution. Not only is this toxin producing process inhibited in the tonsils, but also in the tonsillar nodes and in the lymph glands, which are draining the affected tonsil area.

END RESULTS.

We have brought about an absorption of the inflammatory elements in and about the tonsil and have rendered this entire area sterile. That portion of the normal tonsil which was not destroyed by the pathological process previous to the x ray exposures was not affected by the therapy, and can now carry on whatever function it is supposed to have.

It must be borne in mind that the effects of the x ray are cumulative, i. e., gradual inhibition; that the maximum effect, i. e., saturation point and absorption of the pathological elements, is not reached for at least two weeks, that it remains stationary for two weeks and there is then a gradual diminution, lasting for two weeks or more; in consequence, there is a total time of from six to eight weeks from the last exposure to the entire loss of x ray effect, i. e., complete recovery of functions of normal tissue elements, so that a verdict as to the result can not be given under that time, even though pus may be expressed from the crypts at the time of the last exposure.

DANGERS OF X RAY THERAPY.

Permanent disappearance of hairs and total inhibition of glandular function, i. e., permanent alopecia, no sweat and sebum secretions may occur.

The skin and underlying tissues may atrophy and even ulcerate. These dangers follow, either from improper technic or overexposure, either in a single exposure or from too frequent exposures. By improper technic we refer to forgetting to insert the filter and inexact distance. There should be no guessing, the distance must be exact. The milammetre reading must not be about, but must be kept at one point. In fact, any variation of any one of the factors will change the intensity.

TOO FREQUENT EXPOSURES.

We stated that the change following the first exposure was at the expense of the pathological lymphoid elements and little or no change in the connective tissue. So that an inexperienced or impatient operator, thinking to hasten the process or attempting to comply with the wishes of the patient, makes his exposure at less than biweekly intervals and will invariably get into trouble. Giving to a young person the same exposure as an adult, or exposing an individual with the socalled blond skin will, in the course of time, lead to trouble. Prolonged exposure, i. e., carrying on treatment for months in cases to be referred to later, will lead to atrophies and telangiectasis.

TYPES OF CASES SUITABLE FOR X RAY THERAPY.

As in all surgical procedure, one must choose his case for any given technic, by which we mean that not every enlarged tonsil should be treated by the ray, for if that is done the radiotherapeutist is doomed to certain failure in a portion of his cases. Those tonsils in which the inflammatory process has practically come to a rest stage, will not ordinarily respond to radiotherapy within a limited time safe to overlying tissues. We refer to those tonsils in which the many repeated attacks of acute or subacute inflammatory processes have resulted in the formation of dense fibrous connective tissue, within the capsule of the tonsil proper. The inflammatory process has run its course. The only indication for therapy in cases of this kind is mechanical obstruction, and it is the work of a few minutes for the skilled surgeon to enucleate these fibroid tonsils with comparative safety. These cases, as a rule, leave no aftereffects from surgical therapy. If these cases are treated by radiotherapy, involution and absorption will be very slow and damage to the skin and underlying tissue will undoubtedly result from too repeated exposures.

In the following types of tonsils good results are obtained within safe limits to the overlying tissue: Varying sized, socalled mushy and pus filled tonsils, i. e., the flabby or soft tonsil with dilated crypts from which cheesy, puslike and foul smelling material can be expressed. These tonsils are usually associated with varying degrees of severity of constitutional disturbances, rheumatism, joint symptoms, and even complicating cardiac lesions. They may also be associated with similar processes about the orifices of the eustachian tubes and in the vault of the pharynx. Cultures made from these tonsils are always positive for virulent organisms. These are the cases that are referred to when we said that one of the first things noticed after the first or second exposure was the improvement in the patient's general condition, and these are the cases that clear up in a series of biweekly exposures, lasting from eight to twelve weeks, making from four to six exposures.

LOCAL THERAPY.

We often get a history from patients who come to us with these affected or diseased tonsils of weekly, biweekly or daily visits to the physician who swabs, cauterizes, sprays or uses other local procedures, with the result that there is temporary improvement for varying periods. Of course, one can readily understand that with local therapy alone the deeper processes are not much influenced.

CONSTITUTIONAL TREATMENT.

There is a general building up of the patient, tonics, vaccines, but nothing is done to remove the resistant pathological tissue which flares into activity as soon as the patient's general resistance is lowered.

ADVANTAGES OF RADIOTHERAPY.

All the possible dangers of surgery are eliminated. The following are complications associated with surgical methods, as reported by competent men. While these accidents are rare, they do occur in a certain percentage of cases.

From local or general anesthesia.—In the young, debilitated, and in patients with cardiac and other grave general conditions (status lymphaticus).

From infections.—It is immaterial whether the cause is from aspirated infected clots or from embolus. These cases are diagnosed as tuberculosis. There are many infections into the eustachian tube following tonsil and adenoid operations.

Surgical traumatism.—Either at the time of operation or as the result of scar tissue formation.

CONCLUSIONS..

We do not affirm that x ray therapy has cured anything. The pathological process has been inhibited to a point where the local tissue, assisted by the body's protective forces, were able to carry on their work which before the exposures they were not able to, as the pathological elements had already acquired almost adult morphological and physiological characters and therefore with a resistance too great for these forces to overcome. We also take advantage of every possible therapeutic measure to assist the body forces to carry out this work, namely, local cleanliness, sedatives, vaccine therapy and the building of the patient's general condition.

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2. MURPHY, JAMES B., WITHERBEE, W. D., CRAIG, STUART L., HUSSEY, R. C., and STURM, ERNEST: The Atrophy of Hypertrophied Tonsils and other Lymphoid Structures of the Throat Induced by Small Doses of X Ray, *Journal A. M. A.,* January 22, 1921.

116 WEST FIFTY-EIGHTH STREET.
170 WEST FIFTY-NINTH STREET.

X Ray Treatment of Skin Diseases.—H H. Hazen (*American Journal of Röntgenology,* April, 1922), concludes that röntgen rays are probably the most useful single therapeutic agent that the dermatologist possesses today. It is of the greatest value in both malignant and benign tumors, keratoses, warts, eczema, acne, lichen planus, some forms of tuberculosis, sycosis and folliculitis of the back of the neck, tinea tonsurans, tinea barbæ, some cases of pruritus, granuloma annulare and mycosis fungoides. At the same time a word of warning must be issued, for since the war scores of physicians with totally inadequate training are rushing into röntgen ray therapy and it is certain that some disastrous results will follow. In no case should an erythema dose be administered to the skin, except after careful consideration of malignancy. In addition, it should always be remembered that an erythema dose over a large area of skin is much more apt to result in disastrous sequelæ, especially telangiectasis, than is the same sized dose over a small area. Treatments should never be continued for more than six months, except under very special circumstances.

Proceedings of Societies

NEW YORK ACADEMY OF MEDICINE.

Section in Otology.

Stated Meeting Held on January 13, 1922.

Dr. Samuel J. Kopetzky in the Chair.

Labyrinthine Surgery.—Dr. J. Morrisset Smith read a paper on this subject in which he dealt with the difficulties encountered in diagnosis, present day views of the surgical treatment, and the results obtained. The paper appears on page 85 of this issue.

Discussion.—Dr. Edward B. Dench said that Dr. Smith had so clearly stated the best and most conservative views on the subject that little could be added, and what he had to say was chiefly confirmatory of the very excellent remarks that had been made. He had been gratified to hear Dr. Smith emphasize the point in contravention to the teaching of the German school some years ago that every dead labyrinth should be taken out. He himself had followed the opposite theory for many years. If there were no labyrinthine symptoms, he proceeded independently of them, and in few instances had he subsequently been obliged to interfere with the labyrinth.

He also heartily concurred in what had been said about the examination of the spinal fluid. A persistent high cell count was a good indication for operation. In the invasion of the labyrinth there might be an increase of the cells in the spinal fluid up to 100, even though there was no actual invasion of the meninges. Following this cell count, as Dr. Smith had suggested, one could form a good idea as to the limitation of the process. If the count went very high—above 500 or 1000—the extension was apt to be rapid. If the cell count of the spinal fluid should greatly increase, one would be justified in interfering with the labyrinth if there was evidence of a dead labyrinth or a history of such symptoms being present shortly before the patient came under observation. If a case was allowed to go on with these manifest symptoms, without operating, one felt that he had done wrong; the opposite was also true, and if meningitis developed one would be in doubt as to whether, if Nature had been allowed to wall off the cavity more thoroughly, the patient might have recovered. Many years ago he had seen a patient with a grave and acute mastoiditis, and sudden labyrinthine symptoms with high temperature. The patient was seen on the fifth day after the onset. On the third day the temperature had been high, and when he observed the case the temperature was normal. The labyrinth was dead. The mastoid was clean and there was no injury to the labyrinth, so he advised letting the patient alone, and he made a good recovery. In a similar case later, the patient died. Dr. Smith was absolutely right in saying that at the present time we are much in doubt even in the presence of certain clinical symptoms. In certain cases operation may seem to be necessary, but with delay the patients get well; in other cases, where it seems best to delay operation, the patient may go on to death. It was very difficult for anyone to make any broad statement excepting where there were distinct symptoms of frank invasion of the labyrinth, and then the labyrinth should be taken out. The cases that go slowly are the puzzling ones, and it was gratifying to hear Dr. Smith say frankly that there were times when one did not know what to do.

In answer to Dr. Dench's inquiry whether he referred to the spinal fluid count or to the increased blood count when he spoke of increased leucocytosis, Dr. Smith replied, "In the blood count, where there was involvement." Dr. Dench disagreed with this statement, for in cases where the labyrinth alone was involved there was a certain increase of leucocytes. Perilabyrinthitis cases were interesting and confusing. A certain number of the patients recover with removal of the perilabyrinthine tissue and restriction of circulation within the labyrinthine capsule to normal. he case of the plumber which had been cited was hardly invasion, but rather a case of concussion; even though there were positive symptoms. Dr. Dench said he would not have operated in a case of that kind. He also expressed gratification that Dr. Smith had not split hairs on the subject of diffuse purulent labyrinthitis, for it was difficult to make a differential diagnosis in these conditions at the present time. He had seen a number of acute cases with meningeal symptoms, and even where the cell count was high many of the patients got well without operation. There was no invasion of the spinal fluid with bacteria. Changes in the chemical constitution of the blood might cause the socalled serous meningitis; these patients recovered without operation. The acute cases, where there were frank symptoms and spinal fluid cell count was increased, were not necessarily fatal. Dr. Perkins had once operated on a boy—a patient of Dr. Dench's—with high temperature and all symptoms of meningitis. In addition to removal of the labyrinth and incision of the dura over the area triangularis, a decompression operation had been done in the middle fossa, and when the boy came under Dr. Dench's observation there was almost as much brain tissue outside as inside. Under treatment with Dakin's fluid he made a complete recovery, but died six months later from a reinfection. He had a meningeal fistula and refused operation for closure.

Dr. Dench was interested in what Dr. Smith had said about the possible tearing of the dura over the area triangularis. He himself had had a case at St. Luke's Hospital a couple of years ago. The patient had had no labyrinthine symptoms when a radical operation had been done for a chronic middle ear suppuration. He came in a month later with acute invasion of the labyrinth. At operation an erosion was found over the horizontal semicircular canal, which undoubtedly occurred subsequently to the radical operation. In taking out the labyrinth, the dura was torn externally to the internal auditory meatus. Infection was expected, but the man made a good recovery. That could be explained—for the fluid was always under pressure and tended naturally to wash out any infection from the subdural space rather than to allow it to penetrate—just as by constant irrigation.

With reference to the treatment of the labyrinth if it was accidentally injured during the operation, Dr. Dench said he agreed with Dr. Smith. Two years ago Dr. Richards reported a case in which the stapes was removed accidentally and the patient had meningitis and died, and Dr. Richards was inclined to formulate a rule that in such cases one should drain the labyrnith. Dr. Dench said that four or five weeks later he had a similar case at St. Luke's Hospital and packed over the oval window, etc., with iodoform, and the patient made an uninterrupted recovery—with a dead labyrinth, of course. One could not make a definite rule, excepting that the labyrinthine cavity must be made as aseptic as possible, and that one should be more careful than otherwise if the labyrinth was accidentally injured.

The value of spinal puncture in these cases was sometimes lost sight of. Spinal puncture in beginning labyrinthine involvment had some value, unless in a case where the infectious organisms were actually in the spinal fluid; the restoration of the intracranial pressure had a certain amount of therapeutic value.

Dr. W. L. Dean, Iowa City, expressed gratification at the conservative tone of the paper. In his own experience, the more conservative he had been in treating labyrinthine cases the better the results secured, so far as life was concerned. The research work of Wittmaack had some bearing on this matter. He showed that in some cases of vertigo accompanying nonsuppurative lesions of the middle ear, he had not found hemorrhages in the labyrinth causing the vertigo but that the vertigo was due to a disturbance of the lymphatic circulation inreasing the pressure within the labyrinth.

Dr. Dean said he thought of the labyrinthine complications of acute suppuration of the middle ear and of acute exacerbations of chronic suppuration of the middle ear were of three types. Unfortunately there was no way of differentiating clinically between the three in the early part of the disease. First, there was the hydrops of the labyrinth, a condition characterized simply by an increase in the amount of normal fluid in the labyrinth. In this type, with the return of the normal amount of fluid and normal pressure there was a return of function. The second type was the serofibrinous labyrinthitis. Wittmaack had shown that the difference between this and suppurative labyrinthitis was due to an absence of, and dehiscence in, the wall between the middle and inner ear. This condition might become suppurative in a few hours. In serofibrinous labyrinthitis the exudates organized and might produce permanent loss of function. As there was no pus in the inner ear, the mastoid wound might heal perfectly. The third type was the suppurative type, in which there was always a dehiscence of the wall between the middle and inner ear. This was the dangerous type.

Dr. Philip D. Kerrison expressed his interest in the paper and in the remarks of Dr. Dench and Dr. Dean. During the last two years there had been a great deal of discussion as to whether in the presence of a dead labyrinth preceded by labyrinthine symptoms the radical operation should be performed without the draining of the labyrinth, and the consensus of opinion seemed to be veering to a greater conservatism in regard to opening the labyrinth; but it had not yet been possible to differentiate the cases or even to determine the different types. The conditions so fairly stated by Dr. Dean would explain some of them, and the remarks which he had made, if elaborated in the form of a paper, would add greatly to the understanding of the subject and would provide a working hypothesis for discussion.

In regard to draining or opening a dead labyrinth at the time of a radical mastoid, perhaps each case should be decided on its merits. Whenever there was any reason to suspect an active labyrinthine lesion, however, or even an old labyrinthine suppuration in the slightest degree likely to be rekindled by the mastoid operation, the labyrinthine operation was surely the thing to do. In regard to operating upon the labyrinth during the acute stage of a labyrinthitis, they were all at sea. Whatever might be done in a particular case might prove wrong as judged by the results. He personally felt that in any considerable series of cases more lives would be saved by abstaining from surgical intervention until all labyrinthine symptoms had disappeared than by operating during the acute stage.

As regards lumbar puncture during an acute labyrinthitis or even during the chronic stage, certain facts should be kept in mind: Babinski's experiments had quite clearly shown that lumbar puncture was frequently followed by symptoms clearly induced by intralabyrinthine pressure; this reduction of labyrinthine pressure could only be brought about by the withdrawal of labyrinthine fluid, however small the amount, into the subarachnoid space, and it should be clear that this might initiate a meningeal infection. It would seem, therefore, that lumbar puncture during a suppurative labyrinthitis should not be done as a routine measure, but only when meningeal symptoms were present and called for the definite data which this procedure provides.

Dr. Frederick Whiting said that he had cordially endorsed Dr. Smith's attitude toward the various problems connected with labyrinthine conditions. He did not think that any labyrinth which was fuctioning should be entered under any conditions. A dead labyrinth without manifest disturbance did not call for operation, except where a radical mastoid operation having been undertaken there was found some continuation into the labyrinth. Under such circumstances, as Dr. Smith had suggested, only such operation should be done as was of the most conservative nature. In regard to the third class of cases, one should refrain from operating except when the findings of the spinal fluid indicated that there was an active process instituted; if there was not such a process, more harm was done by operation than by refraining. As he understood it, this was the attitude taken by Dr. Smith, and he was glad to endorse that position.

Dr. Kopetzky said that it was only by reporting these borderline cases that definite conclusions could eventually be reached. Every one encountered these problems and they should be brought before the section and presented from the personal point of view.

Dr. J. Morrissett Smith, concluding the discussion, said that the hydrops and serofibrinous types of which Dr. Dean had spoken would come under the class of localized labyrinthitis. The fact that the labyrinth was still active showed that there was not a diffuse condition there, although it might at any time become diffuse. Where the condition became purulent, there was at once a dead labyrinth. The question as to whether one should do a radical mastoid alone where there was a dead labyrinth and no symptoms brought up an interesting question. It was important to have a spinal puncture as soon as it was discovered that there had been trouble in the labyrinth. If the spinal fluid was normal and the patient had no symptoms, it was fairly certain that whatever infective process might have been present, had subsequently been walled off from the meninges. He agreed with what Dr. Whiting had said—if there was a normal fluid and no temperature, a radical operation was done and no evidence of visible necrosis found, it would be better policy to let the labyrinth alone.

Referring to Dr. Kerrison's statement about the danger of a spinal puncture in an acute labyrinthitis, Dr. Smith said he thought that was more theoretical than practical, for in the case of acute labyrinthitis referred to, the patient started out with labyrinthine and meningeal symptoms, repeated lumbar puncture was done, and though the count went to 8000, the patient recovered. Two years ago, he had treated, at the Polyclinic, two cases of fractured skull with mastoiditis and secondary meningitis. The fractures ran across the mastoid to below the temporal ridge. The two cases occurred within six weeks of each other. The first patient was unconscious and had a stiff neck; spinal puncture showed a cloudy fluid with no bacteria. The next day he seemed a little better and another lumbar puncture was done. A secondary mastoiditis developed, he was taken to the operating room and a thorough mastoid operation was performed and he promptly died. Evidently the adhesions were broken up, death resulting. Within six weeks, the other patient was brought in, unconscious and with a stiff neck, cloudy fluid and no bacteria. Here the puncture was repeated daily; each time the patient showed improvement. Then drainage was obtained by simply removing the cortex. Three months later, the patient was demonstrated in the clinic, had a convulsion, was found to have a large brain abscess and eventually died. These cases both showed improvement following repeated punctures. Dr. Smith said that in his opinion, repeated lumbar punctures, instead of being detrimental, were a distinct aid, especially where there was a tendency towards localization of the process.

Dr. Smith said that he understood Dr. Kerrison to say that in case of accidental injury to the labyrinth during operation, he would do a labyrinth operation where labyrinthine symptoms developed, but had evidently misunderstood him and agreed that the case should be kept under observation and a labyrinth operation performed only where meningeal involvement indicated it.

MEDICAL SOCIETY OF THE STATE OF NEW YORK.

One Hundred and Sixteenth Annual Meeting, Held in Albany, April 18, 19 and 20, 1922.

Dr. George W. Cottis, Jamestown, N. Y., Presiding.

(Concluded from page 719, Vol. CXV., No. 11)

Some Factors of Safety in the Preoperative and Postoperative Treatment of Goitre.—Dr. Emil Goetsch, of Brooklyn, said that he had worked on a technic for combating thyroid postoperative acidosis, by means of the administration of intravenous glucose solution. Acidosis was likely to develop in the last twenty-four hours after operations for hyperthyroidism. The reaction was distressing and showed nervousness, nausea, vomiting, headache, dry tongue, acetone breath, acetonuria, etc. These symptoms could be avoided and the patient safely tided over by intravenous glucose medication. The author said that the epinephrine sensitiveness test and the metabolic rate were determined preoperatively, to decide the type of operation. In acute cases operation was postponed. Prolonged thyroid hyperactivity gave rise to reduced glycogen storage in the blood. The blood sugar in hyperthyroidism was studied before, during, and after operation, and compared with normal controls. The normal showed a definite increase in glycemia at operation, continuing high and dropping to normal after ten days or so. In hyperthyroidism, the rise was more sudden, with a sudden postoperative fall to below normal. The adrenals were excited by fear of the operation and played a contributing part in the blood sugar disturbance. In the blood sugar tests made, acetonuria was regarded as an evidence of acidosis. The methods used were qualitative, not quantitative. The reaction was indicated by one, two, three or four plus. To avoid circulatory embarrassment the glucose was injected slowly, the renal threshold level never being exceeded. In hyperthyroidism the normal glycogen storage was depleted so that there was no response to the factors calling for glucose. The glucose was a freshly prepared, chemically pure solution, administered as soon as acetonuria appeared. The dose was from 300 to 750 c. c.—This controlled the unpleasant postoperative reaction.

Dr. Charles W. Webb, of Clifton Springs, N. Y., said that Dr. Hubbard, their chemist, had worked out a quantitative method for measuring the acetone output. Hypoglycemia existed in these cases, and excessive quantities of acetone and B-oxybutyric acid were eliminated until controlled by carbohydrates. When not tolerated by rectum, owing to the excessive irritability of the bowel, the intravenous route was used. Before operation, candy and carbohydrates were given as much as possible, to ward off unpleasant postoperative sequelæ. The amount of operation was gauged by the metabolic rate determination and adrenalin hypersensitiveness.

Dr. Eugene Pool, of New York, said he was grateful for this contribution, although he had not quite grasped the physiological premises upon which the paper was based. These cases were neither medical nor surgical. They were both. They needed prolonged medical attention and the bringing in of accessory means (surgery and x ray) at the right time. Criticism had been made of the Goetsch test. If it was done exactly as Goetsch did it, it was valuable, but not otherwise. A metabolism plus 90 was an operative contraindication, but three quarters of the cases should receive surgical aid. Ligation could be done first, with lobectomy when the patient could stand it. The thyroid was not the only gland involved, but it was the only one known. As to acetonuria, this was presumptive evidence of acidosis, but there might be compensation for the increase of acetone bodies liberated by fat oxidation. Proof of acidosis must be looked for in the hydrogen ion content of the blood. In regard to blood sugar, that question was not settled, but positive benefit might be obtained by glucose administration before operation. This produced satisfactory results and would be followed in future practice.

Dr. Bielby, of Albany, said that with better technic and a better selection of cases, the best surgeons had got a mortality which was practically nil. In his own recent series of eighty consecutive cases there was no fatality. He had not seen what Dr. Goetsch called acidosis; there was an uncomfortable period twenty-four hours after operation, but the patients could be assured that this would pass within thirty-six hours. Before operation he had disturbed the routine of the patient as little as possible—had allowed nourishment and avoided catharsis. He had never refused patients, but progressed with operative indications as occasion warranted.

Dr. Goetsch, in closing, said that he had found the bowel so irritable that patients could not hold a rectal injection of glucose, therefore the intravenous method was used. Extreme hyperthyroidism was a great problem. Acetonuria might not be an index of acidosis, but it certainly was an accompaniment. Acidosis was a complex problem and the best chemists were working on it. The chief point was that it could be relieved by carbohydrates. The glucose used was chemically pure, with no sulphuric acid, and if freshly prepared had no acid reaction and caused no disturbance. In regard to the x ray, it was useless in thyroid adenoma, a benign tumor, easily shelled out, but in Graves's disease, a type of unknown origin, it might be useful, the only disadvantage being the uncertainty of standards among radiographers. A system of depth of penetration and of dosage would help to solve the problem.

Mixed Tumors of the Parotid and Their Treatment by Radium.—Dr. F. McN. Johnson, of New York, grouped these tumors in three types, namely, benign adenoma malignant adenocarcinoma and mixed tumors. The first, he said, grew slowly, was encapsulated in the gland and rose from acini or glandular ducts; occasionally malignant changes were seen. The second type of growth developed rapidly, sometimes metastasized and sometimes contained cysts. The malignant ones were solid. The third type arose from embryonal remnants. Radium always acted on the same tissues in the same way, therefore these tumors probably gave the same reactions as other tumors of the same type. Abbe had reported a five year cure. The youngest patient treated was four years old, the oldest eighty-two. In one case there were eleven recurrences. In these cases deep penetration could be used without destroying the skin or the cranial nerve if care was used. Radium might produce good results in cases unfavorable for surgery.

Limitations of Röntgen Diagnosis.—Dr. Russell D. Carman, of Rochester, Minn., deplored the tendency of the clinician to rely on laboratory diagnoses without checking up the findings. The technician was competent to make good radiographs, but he could not be trusted to make a diagnosis. Röntgenography could indicate or exclude many conditions, but it could not replace proper clinical examination. Another fault of the physician was to expect to find what the x ray did not reveal. The x ray was of great assistance in gastric, duodenal or colonic lesions, but it could not define the type or possible malignancy. The x ray, the test tube, and the microscope constituted a powerful trinity, but the physician must keep his seat at the head of the council table and bring laboratory aids into a coherent unit.

Dr. Stewart, of New York, said that only close cooperation between physicians would prevent the mistakes constantly made. Team work was essential. Many physicians depended on the röntgenologist for advice he was not competent to give. They not only asked for the diagnosis, but also for the treatment. The röntgenologist could state the extent of the involvement, but not whether a lesion was operable or not.

Röntgenotherapy in Malignant Disorders.—Dr. George E. Pfahler, of Philadelphia, said that malignant disease was so loathesome, so ubiquitous, and so insidious that all means of combatting it must be sought for. Radiation and surgery combined achieved the best results. In regard to the influence of radiation on various lesions: epithelioma of the skin included two types, basal cell and prickle cell. The former responded to radiation. In cancer of the skin, electric coagulation was used first to destroy the lesions, followed by full radiation. In carcinoma of the mouth and tongue, the lesions were difficult, and best treated with radium needle insertion, followed later by surgery to repair the tissues. In laryngeal cancer a preliminary tracheotomy was done, followed by radiation through the thyrohyoid membrane. In carcinoma of the breast, a preliminary radiumization was used to devitalize the cells. Three weeks later the tissue was removed, including fibrous tissue which might contain some malignant cells. The radiation was given over the mammary region, the supraclavicular region and the axillary region. Mediastinal tumors were treated with combined radiation and surgery. In carcinoma of the uterus, extensive local disease was unsuitable for radiation. Systemic symptoms yielded to the rays. Radium was suitable in early metastases. Sarcoma cells were more sensitive than carcinoma cells. In cervical cancer radium treatment plus the x ray gave the same result as surgery.

Traumatic Backs and Their Treatment.—Dr. James Warren Sever, of Boston, said that these cases were usually seen in industrial accidents, where the psychological element of litigation usually delayed recovery. Ligamentous and muscle tears were usually undiagnosed at first, and treatment was delayed. This prolonged the injury and the average disability was about six and a half months. Contrasted with this, the injuries from direct violence (fractures and dislocations) were sooner recognized and treated. The disability averaged six months. Such injury, in older subjects, tended to light up hypertrophic arthritis which was often latent, and claims were made for long disability. This was unfair from a compensation viewpoint. Usually the patients did well without operation, if put to bed in fixation. On rising from bed, a light brace protected the back from strain.

Dr. Sever, in closing, said that it was unfair that long continued compensation should be paid for coincident arthritis. In regard to tuberculosis of the spine, the kyphosis was progressive, that in fractures never became large and did not progress. In fracture, the treatment was psychological as well as anatomical; people got along well if they did not know they had a fracture. If they did, they went to pieces mentally and physically.

Operative Treatment of Idiopathic Scoliosis.—Dr. Armitage Whitman, of New York, said that this series excluded scoliosis from known causes. The cases occurred usually in girls with bad posture and poor health. The x ray showed lateral curvature with wedging of the vertebræ. Such deformity progressed, causing internal misplacement and early death. Treatment was by correction, as much as possible, followed by a fusion operation. The older the patient, the better the fusion.

Lieutenant Colonel MacKenzie Forbes, of Montreal, said that physiological scoliosis had been tried as a corrective to pathological scoliosis, and the result was a failure. The greater could not be cured by the less. In cases where the deformity was progressive and correctable, the fusion operation, while severe, was justifiable, as a life saving procedure. Where long segments were fused a firm ankylosis was necessary.

Urinary Calculi.—Dr. Thomas F. Laurie, of Syracuse, said that a crystallizable substance, with agglomeration, must be present to form calculi. Slight infection usually was the starting point. Renal calculi were a constant menace and should be removed. Pain in ureteral calculi was from distention above the stone. Stricture produced the same pain. The stone could usually be shifted and brought down. Large stones required crushing before removal. Suprapubic cystotomy might be necessary. One should never neglect to look for a second stone. All stones were not opaque to the x ray, but it was good advice to take a second picture, when in doubt.

Treatment of Bladder Tuberculosis.—Dr. Edward L. Keyes, of New York, said that after preliminary nephrectomy for renal tuberculosis, there remained a chronic painful rebellious condition of the bladder. The patients were often in prolonged torture. Bladder ulcers were often due to secondary infection. These could be treated, the urethra stretched, strictures removed, and nitrate of silver cautery made use of. Any means that would help to make life more tolerable for the patient was worth trying.

Dr. Edwin Beer, of New York, said that patients now came for examination and operation earlier, and the old, enormous tuberculous kidney was an antique. Education as to the seriousness of vesical irritation was still necessary. There was one class of cases with frequency, strangury, etc., in which relief was obtained by high frequency treatment; but in tuberculous cystitis with mixed infection, nothing short of continuous irrigation would give relief.

Diagnosis of Bone and Joint Lesions by the X Ray.—Dr. Frederick H. Baetjer, of Baltimore, Md., said that bone was looked upon as fixed, but that in periods of years it underwent changes. There were three age periods of bone: 1, the growing period, from one to twenty years, when the epiphyses were united to the cartilage and there was increase in length and width of bone; 2, period of maximal health, from twenty to forty years; 3, period of decline, after forty. In different age periods different lesions attacked the bones. In the hip, for instance, during the first period fracture occurred as epiphyseal separation. In the second period the synovial membrane slipped. In the third period, the bone was brittle owing to absorption of calcium salts and fracture of the femoral neck occurred. In childhood the flexible bones suffered green stick fractures; in older people long oblique fractures occurred; in the aged, compound, comminuted fractures. Disease of the bone also varied with age periods, in accordance with the structure of the bone. Infection might enter the bone through the cartilage, through the long medullary canal which was rich in fat, or through the cancellous bone at each end which was more vascularized. There might be as a result, bone production or bone destruction. The lesion might be benign or malignant; if the latter, the surgeon did not want to operate. Lesions might be identified by their point of origin: the medullary canal, the cortex, or the periosteum. Invasion of tissue showed malignancy.

Bone lesions in children followed three age periods: first from one to three; second from three to six; third from six to fourteen. To the first belonged scurvy, rickets, lues. Scurvy showed destruction of the bone ends; rickets softening of the epiphyses; lues, bone production and periostitis. From three to six years tuberculous lesions of the joints were common; after six years Perthé's disease was most often seen. Lesions also showed an age and sex incidence. From one to five years lesions were equal in the two sexes; from then on, the male played more dangerous games and later had more dangerous trades, and consequently suffered a higher proportion of trauma. After fifty the two sexes became equal again in this respect. In regard to neoplasms, bone disease might occur from carcinomatous metastases, in the female following cancer of the breast, in the male, cancer of the prostate. Infectious arthritis might take place at any age, and no known source of infection had been proved. Atrophic arthritis was probably an atypical form. Hypertrophic arthritis was a disease of elderly people, and not of the young. This short classification might serve as a guide to students and give them some definite idea what to look for.

An Improved Method of Applying Radium Through the Cystoscope.—Dr. Leo Buerger, of New York, described certain improvements in the cystoscopic armamentarium which had developed that enhanced the accuracy of and increased the potency of intravesical radium therapy. Their results with these new procedures had been so gratifying and encouraging that they hoped, in the near future, to be able to report a series of cases that would bear testimony to the value of the proposed methods and further to show that in a certain field of carcinoma of the bladder, as good end results were obtainable in the use of the cystoscopic method as with the combination of radium and surgery. The field for cystoscopic radium therapy was three fold, namely, 1, for treatment of carcinoma alone without surgery; 2, for the treatment as a preliminary step to surgery, and 3, for the treatment of metastases. There were distinct circumstances that might lead one to adopt the cystoscopic methods of radium work, as, 1, when the patient, by reason of his age, habits, special prejudices, knowledge of physical mediocrity, or what not, would refuse any operative interference; 2, when we ourselves would deem surgical intervention contraindicated for one reason or another. They gave cystoscopic radium application preference when the growth was small and appeared amenable to radiation, but was so situated that an extensive operation compromising one ureter and requiring ureteral implantation would be the only correct surgical procedure; when dealing with that type of small carcinoma which they had heretofore successfully treated with snare and fulguration alone, but which was occasionally followed by local recurrence or invasion of the bladder wall; because the growth was in the main a papilloma with evidences of carcinomatous change, was small, was readily accessible, but because of its potentialities for deep infiltration, needed more intensive treatment than fulguration and the snare, even though they had time and time again obtained cures in this type of growth without radium and without surgery. This feeling that radium was required they had acquired through the knowledge of their ability to foretell in advance as to which of the small papillomata were already attended with malignant cell invasion of the wall of the bladder, and in which such infiltration was absent.

Changes in Virulence of Tubercle Bacilli.—Dr. Edward R. Baldwin, of Saranac Lake, called attention to the fact that methods for determining differences in virulence of tubercle bacilli had been unsatisfactory. There was need of a dependable method for making these determinations. A method of estimating the virulence of tubercle bacilli was presented, which was based on guineapig inoculation. The application of this method had shown that a culture known as R 1 of human tubercle bacilli, thirty years old, retained but slight pathogenicity. A culture, H 37, isolated seventeen years ago, was still quite pathogenic. A culture of bovine turbercle, B 1, twenty years old, was still virulent for rabbits. Experiments recently published on the pathogenicity of acid fast timothy, butter and reptilian bacilli for mammals was still in need of confirmation. It must be remembered that pathogenicity for rabbits and guineapigs might not be a measure applicable to man. A reliable means of estimating the presence or absence of virulent strains of tubercle bacilli would provide a valuable aid in prognosis.

Abstracts from Current Literature

SURGERY

Operations on the Foot.—A. G. Cook (*Journal of Orthopedic Surgery,* September, 1921) giving the report of the commission on stabilizing operations upon the foot gives the following conclusions: 1. Metal plates, wires, screws, nails, are objectionable and unreliable. 2. Silk ligatures and bone grafts are also objectionable and unreliable. 3. Arthrodesis produces excellent results in lateral instability, especially where there are good calf muscles. The best results are to be found after the triple arthrodesis of Ryerson or the subastragalar arthrodesis of Davis. Arthrodesis of the ankle joint is rarely indicated. 5. Astragalectomy with backward displacement of the foot gives by far the best results, when done after the method of Royal Whitman, first for calcaneus, calcaneovalgus, etc.; second, for dangle feet, and third, for lateral deformity. In some cases the result has been so perfect and the foot so symmetrical that it would have been difficult to tell that the foot had been operated on, had one not been able to see the scar. 6. Horizontal transverse tarsectomy, after the method of G. G. Davis, gives as a whole inferior results to the astragalectomy and is a more difficult, bloody and less surgical procedure. 7. Living ligaments, after the method of Gallie, Putti, Peckham and others, have given success in isolated cases, but as a general rule have not been successful and are not held in universal esteem. A great many of the fixation cases that were examined were done after the ordinary tendon transplantations had failed, and it would seem that the place for tendon transplantations is as an adjuvant to a stabilizing operation.

Plastic Operations.—L. Eloesser (*Surgery, Gynecology and Obstetrics,* April, 1922) give the following findings in plastic operations: 1. A graft of the whole thickness of skin, whether done at one sitting as a Wolfe-Krause graft, or at several, as an Italian plastic, always remains an island surrounded by scar. 2. It turns blue on exposure to cold and is little resistant to infection or trauma. 3. A pedicled flap which retains the normal vascular connections does not have these disadvantages. 4. A procedure is described for making a semidetached flap, severing the skin of the pedicle but retaining its vessels. Such a flap has much of the freedom of a free graft but does not have its disadvantages. 5. More blood runs through the pedicle of an Italian plastic flap than through the line of union with its new bed, no matter how narrow the pedicle, or how long the line of union. 6. The vascularity of the pedicle should not be damaged by mattress or tension sutures. 7. Infection should be limited by covering the defect left by an Italian flap with an immediate Thiersch graft. 8. The viability of the flap is determined by temporarily occluding the pedicle with a rubber band before finally severing it. 9. The defect, after excision of a flexion contracture of a finger, may be covered by a flap from a neighboring finger. 10. Drooling may be relieved by transplanting Stenson's duct backward.

Treatment of Closed Fractures.—Stanley and Gatellier (*British Journal of Surgery,* October, 1921) state in summary that the simplicity and the ease of application of the Parham-Martin bands establishes their superiority for closed fractures to all other means of operative splinting. Their application is carried out with the minimum of operative manipulation, and perfect apposition is ensured and maintained. They are better than wire for encircling the bone. We have been able to observe the remote results of fractures thus treated in cases where we have been obliged to reoperate, and in a series of radiographs. They show that the objections made to metallic osteosynthesis, which are very real, cannot be applied to the use of Parham's bands. The consolidation is certainly not delayed, there is no necrosis at the point of contact of the band, and it is surrounded by callus (a small clear space may remain). Furthermore, any organic iron salts that may be formed have no toxic effect on the tissues; the callus is not excessive in quantity, and is frequently reduced to a minimum. Lastly, the bands very rarely give trouble from their presence, and may with confidence be left buried. Transverse fractures require to be treated with metal or bone plates (or splints) encircled by the bands. The authors' results with bone plates have been disappointing, though they admit Nageotte's principles in theory, and believe the work of Gallie and Robertson to be most valuable, though needing clinical confirmation in its application to recent fractures. They are satisfied with their results with Sherman's metal plates and bands, but their failures corrected their technic. Certain principles in technic must be adhered to if perfect results are to be secured.

Excision of the Head of the Femur in Arthritis Deformans (Osteoarthritis) of the Hip Joint.—Harry Platt (*British Medical Journal,* April 29, 1922) recommends the following technic: 1, The removal of the overhanging portion of the femoral head, leaving the stump of the neck long enough and the upper end rounded off to simulate the new head. 2. The stump of the neck should be fitted deeply into the acetabulum by full abduction of the limb. 3. The detached great trochanter should be reattached to the femoral shaft at a lower level. The other technical details include the use of a wide osteotome with a curved shaft to reproduce the rounded stump of the neck; the surface of the cancellous tissue and the area left by detachment of the trochanter should be thoroughly impregnated with Horsley's wax; the latter area should then be covered by a small aponeurotic flap elevated from the vastus externus muscle and turned upward; Brackett's posterolateral route of approach is the most adequate. For six weeks an abduction frame is applied, the hip being completely immobilized by fixed extension for the first three weeks only; after that massage and active motion are given daily. During the intervals active motion is encouraged. After six weeks a caliper walking splint is applied and the patient uses crutches, and a few weeks later full weight is borne on the caliper ring and the crutches are discarded. The physiotherapy is continued for some months and the caliper splint is retained for at least three to six months. This operation is indicated for pain or malposition in moderately advanced cases at any age, provided the general condition will stand a major operation. The degree of mobility attained depends upon the amount of bone removed from the femoral head.

Experiences with Parasacral Anesthesia in 130 Vaginal Operations.—Friedrich Burgkhardt (*Zentralblatt für Gynäkologie,* April 29, 1922) administers codeonal or bromural on the night before the day of operation and one hour before the operation an injection of laudanum 0.04 gm. and scopolamine 0.0004 gm. The room should be darkened, the patient's ears should be stuffed with cotton and her face covered. All unnecessary noises in the operating room should be avoided. The steps of the operation should be explained to the patient to obtain her cooperation and to reassure her. In all but one of the 130 cases the anesthesia was successful. There is no danger in injecting 250 c.c. of a 0.5 per cent. novocaine suprarenin solution, which should be prepared fresh just before the operation. Careful handling of the tissues to be injected is necessary to avoid sequelæ like hematomata and infections. Only one coat of iodine is used for disinfection. The cases included vaginal total extirpations with and without pararectal incisions, Schauta-Wertheim operations for prolapse, extirpations with dissection of the ureters for cervical carcinoma, perineal plastics, vaginal fixations, Whitehead operations for hemorrhoids, Bartholinian cysts, rectal plastics for fistula, vaginal Cæsarean section, carcinoma of the vulva with bilateral extirpation of inguinal lymph nodes and vesicovaginal fistula. This technic gave invaluable results even in the most extensive vaginal operations. In some cases at the most fifty drops of ether or ethyl chloride had to be used. In three cases abscesses formed but soon healed after their incision and drainage. There were no disturbances in wound healing, of the general condition and no secondary hemorrhage. Injection into the veins must be carefully avoided.

The therapeutic application of parasacral anesthesia was also tried in obstinate cases of sacral and coccygeal pains that yielded to no other treatment, such as those occurring in the climacterium and those based on a general neurosis. In these cases the sacral concavity is filled extensively with the solution and especially in the region about the sacrococcygeal joint and about the coccygeal tip.

Fracture of Femur.—E. L. Eliason (*Annals of Surgery,* August, 1921) asserts that in patients under eight years of age the Bryant or perpendicular treatment gave the best figures, eighty-five per cent. excellent, or one hundred per cent. good results. In this group all results were reported as good. In the eighty-eight cases ten years of age or older, the primary reduction and dressing was not satisfactory in a single case. A small group of eight cases later set in plaster under traction, all showed shortening or nonunion. The next group of twenty cases dressed in the flexed position with weight traction gave twenty-five per cent. good results with no deformity. In operative cases infection occurred in none of the drained wounds. Every case, however, showed slight infection around the Steinmann nail. Internal fixation failed to hold the fracture in twenty-one of fifty-four cases. Causes of this failure were in the greater number of cases due to the position in which the limb was splinted, twenty being dressed in the flat position, and to a much less extent to infection, only three cases. Nonunion, or better, union delayed longer than seven weeks, was most often due to faulty fixation of the fracture, and occurred in 22.2 per cent. of the operative, 0.86 per cent. of the nonoperative, and ten plus per cent. of the entire series. It is hardly fair to include these figures as other than undetermined, as they have not been heard from finally. Operation gave 81.6 per cent. good results; nonoperative methods gave 73.9 per cent. good results in the entire series of 115. It must be remembered, however, that this last figure is helped enormously by including the twenty-four youngsters with one hundred per cent. good results. Of the operative procedures, the use of plates and screws with wound drainage and the limb dressed in plaster, in flexed position, with postoperative traction maintained, gave ninety per cent. perfect results, plus ten per cent. good. All other operative methods gave but thirty-three and one third per cent. perfect results plus thirty-three and one third per cent. good results. Plaster castings are not a good permanent dressing unless traction is used and the case kept under close observation until union is firm, and especial care being taken as shrinkage of the limb occurs, a new cast be applied. This last is very important, for if there is too much room in the cast at the fracture site, each time the patients raise themselves in bed the psoas muscle acting against the fracture will loosen the internal fixation. If these precautions are taken, however, plaster makes an excellent dressing if cut out so as to permit knee and ankle motion. From these facts we see that the best treatment was operation with plate fixation and drainage, and the same amount of attention given to external fixation, flexed position and traction as would be given were the case treated by the closed or nonoperative method.

Surgery of the Lung.—S. Lloyd (*Annals of Surgery,* November, 1921) states that indications for operations on the lungs are as follows:

1. For tuberculous cavities where gas injections into the pleural cavity, either because of too rapid absorption of the gas or because adhesions prevented the collapse of the lung, extrapleural thoracotomy should be performed. This may be completed or in stages, depending upon the condition of the patient.
2. For bronchiectasis, extrapleural thoracotomy may be performed, although incision and drainage or lobectomy offer a better chance of a radical cure.
3. For foreign bodies which cannot be removed by bronchoscopy, thoracotomy, with direct removal by incision through the lung, would be the method of choice.
4. For hemorrhage with increasing hemothorax, compression of the lung and displacement of the heart and mediastinum, thoracotomy with suture of the bleeding point is indicated.
5. For abscess, thoracotomy and drainage of the abscess, attaching the pulmonary pleura about the opening of the lung to the parietal pleura in order to effect direct drainage, will give the best results.
6. For tumors of the chest wall, including the ribs and pleuræ, complete removal with a pediculated skin flap from the abdomen has been successful.
7. For tumors of the lung, thoracotomy and direct excision by partial or complete lobectomy offers the only chance of curing the patient.
8. For empyema, early and frequent aspiration, followed, if necessary, by intercostal incision and drainage.

Causes of Failure in Operations for Chronic Appendicitis.—Charles J. Rowan (*Minnesota Medicine,* June, 1922) from a study of his own and other men's results admits that there is room for improvement in the operative treatment of chronic appendicitis. To secure better results the following points are of great importance: 1. These patients should have more careful examination and often more prolonged observation, especially if the condition is not in every way typical. 2. No patient should be regarded as having typical chronic appendicitis unless a history of a former characteristic acute attack is obtainable. 3. Extra care and consideration should be used before advising operation in neurotics, especially those with colitis or visceroptosis. 4. More exploratory incisions should be used in preference to the muscle splitting incision, and always in atypical cases; the exploration should not end with the discovery and removal of a diseased appendix. 5. A considerable amount of trouble complained of after operation may be due to adhesions, therefore, Gibson's suggestion is valuable as to using picric acid instead of iodine in the preparation of the site of operation.

Tendon Transplantation.—M. A. Bernstein (*Surgery, Gynecology and Obstetries,* January, 1922) says that tendon transplantation has a definite indication in the operative treatment of anterior poliomyelitis. If the results obtained are not satisfactory, the indications in a broad sense were not well defined. Tendons should be transposed from the same plane when possible. When transposed from an opposite group, muscle training must be carried out, over longer periods. Tendons must be transposed with their sheath and peritenous structures so that the vitality of the tendon is not interfered with. When a tendon is transposed with its sheath adhesions are not likely to occur. The operation must be carried out with care, avoiding trauma, exposure of the tendon to the air, and with as little handling as possible.

HEART AND BLOODVESSELS

Cardiac Disease and Occupation.—R. O. Moon (*British Medical Journal,* May 20, 1922) states that cardiac patients need not necessarily be confined to sedentary work, but that they may engage in more active work, provided that it is selected and gauged by the power of the myocardium. It is important to determine how far the work seems to suit the man, how far he is physically attuned to it, and also as to the keenness about his work and the keenness for his wages. In deciding the future occupation of a boy with valvular disease (usually rheumatic), some sedentary work is advisable, as there may be a recurrence of the rheumatic attacks, and besides, boys are likely to overstrain themselves at heavy work. Much depends upon the man's education, previous training, general mental equipment and temperament. A man should work well within the limits of his capacity so as to leave a margin of safety. Mental and emotional stresses may cause a cardiac breakdown nearly as often as physical exertion. Cardiacs should not be sent to a convalescent home in the country when they really require a suitable occupation near their own home.

Cardiac Pain.—John Hay (*Lancet,* May 6, 1922), asserts that all forms of cardiac pain are in essence of the same nature though varying in degree. It is not an evidence of any particular variety of pathological condition, but rather an indication of functional disability. Too much attention must not be given to the pathology. In fatal angina pectoris, the heart may show no evidence of either coronary disease or changes in the aorta, valves, or myocardium. The degree of pain is no indication of the extent of the actual disease. It is very important to determine whether a pain about the thorax or epigastrium is cardiac in origin or not, but this is not always easy. The classification of cardiac pain into submammary and supramammary does not hold with any degree of certainty, although the supramammary is the more ominous type. It should be remembered that visceral distress reaches consciousness indirectly, the related segments being excited, and pain is felt in the areas of the correlated cerebrospinal nerves. Although anginal pain is more usually left sided, it may be most marked to the right of the middle line, extending to the right arm. In typical attacks of angina pectoris the combination of anguish and sense of imminent death cannot be mistaken, but in the atypical forms, especially when the symptoms are slight, the initial warnings may be mistaken for indigestion or rheumatism and neuritis.

In subjects of angina there is a marked tendency to aerophagia which may cloud the picture.

In giving the prognosis other signs of myocardial fatigue should be sought, such as dyspnea, a sense of constriction, complete lassitude and the fear of impending death. After considering the improvement following rest, the condition of the nervous system should be considered—how it responds to mental and physical rest and sedatives, especially in women, who frequently show palpitation with faintness and exhaustion, constriction of the chest, shoulder and arm pains and hyperalgesia. If the attacks become more frequent and more severe in spite of rest and care, the myocardium is becoming weaker and death may occur at any time. The prognosis is favorable in the toxic, neurotic and hysterical cases. The patient should be taught to be honest with himself and lead a more leisurely life. Probably the tenderness in the accessory muscles of respiration is the result of cardiac stress, reaching them through the spinal cord.

Angina Pectoris.—Max Grossman (*Wiener klinische Wochenschrift,* April 20, 1922), asserts that this disease is due to a spasm of the first part of the aorta, which produces no obstruction to the circulation but does cause vascular pains. It is likely that in the severe cases changes and spasms of the coronary vessels occur; probably the radiation of the pain is produced by the advance of the spasm in the arteries of the affected region. This conception explains not only the prompt effect of the vasodilator remedies but also the marked similarity of the clinical picture of the socalled true and false angina pectoris. The difference does not lie in the mechanism of origin of both forms, but only in the organ affected. In the first case the spasm results in a syphilitic, atheromatous, or otherwise changed aorta, and in the second case in an anatomically intact aorta. Röntgenological investigations which are in progress may support this view. The exciting causes of an attack of angina pectoris act on the aorta through the sympathetic nerve.

The Effect of Amyl Nitrite and Atropine with Special Consideration of Stenocardia.—With the aid of the mercurial oscillometer, Sigismund Peller (*Wiener Archiv für Innere Medizin,* April 5, 1922), showed that the pulse frequency and the pressure of the vagus were not implicated in the characteristic changes ushering in angina pectoris and that therefore they were not caused by weakening, exclusion or overcoming of the negative chronotropic and inotropic vagus effect, but only by accelerating stimulation or by myogenic processes in the heart. A shortly lasting vagus pressure influenced neither the pulse frequency nor the attack, but a pressure of five to twelve minutes led to the induction of attacks and to a reduction of pulse frequency and of the pressure, with relief from the attack and rest at night for the patient. Amyl nitrite produced a fluctuation of six to eight beats in the pulse; atropine showed the same results. If the spasm in the coronary or aortic root region is relieved by amyl nitrite or atropine, the uncomfortable sensations disappear and the stimulation for the accelerator nerve and auricular musculature disappears. If the other effects of amyl nitrtie (direct action on the vagus centre and better circulation in the heart) did not increase the heart action, the pulse frequency and pressure would fall. For this reason there is reduction of the pressure at one time and no change or even perhaps a rise of pressure from amyl nitrite at another time, but nevertheless even the last condition does not produce an attack of angina pectoris.

The Heart in Infectious Disease.—Paul D. White (*American Journal of the Medical Sciences,* March, 1922) says that the heart is affected in two ways in acute infectious disease: First, by direct permanent damage to endocardium, myocardium, and pericardium, and second by temporary poisoning. For both of these conditions it is necessary, first, to combat the infection itself by specific therapy, if there is such, and by good nursing care. The symptomatic therapy of cardiovascular symptoms and signs in the prevention of failure is on a very uncertain basis at present and needs further investigation. The routine employment of digitalis in such infectious diseases as typhoid fever and pneumonia is unwarranted. Finally, the frequent occurrence of the effort syndrome during and following infectious disease and simulating at times cardiac disease is in need of emphasis.

Stenosis of the Isthmus of the Aorta and Its Differential Diagnosis.—A. Edelman and R. Maron (*Wiener Archiv für Innere Medizin,* April 5, 1922) maintain that this condition is occasionally overlooked in life. They report a case with marked dullness over and on both sides of the sternum, a protrusion and a thrill to the right of the sternum, pulsation in the jugular vein and an Oliver-Cardarelli symptom; the heart sounds were heard the loudest over the aorta; the cardiac dilatation with the aortic configuration and the röntgenogram led to the diagnosis of aortic aneurysm and aortic insufficiency. The Wassermann reaction was negative. The finding of a new symptom led to a change in diagnosis—a large number of superficial, fairly symmetrically coursing, markedly pulsating and atheromatous vessels, located bilaterally in front, laterally and especially posteriorly, over which a systolic sound was audible. A distinct pulsation of the abdominal aorta was not demonstrable. The blood pressure in the arms was 200 mm. Hg and in the legs it was 55 mm. Hg. There was also a striking disproportion between the total length of the body and that of the lower extremities. The röntgenogram showed that the left cardiac border was absolutely free above in spite of the enormous widening of the ascending aorta and the first portion of the arch; neither the most peripheral portion of the arch nor the uppermost portion of the descending aorta was demonstrable. The pulse was increased in the vessels and capillaries of the upper part of the body, it was impalpable in the abdominal aorta and very weak, apparently retarded, in the femoral artery, and not demonstrable in the tibial and dorsalis pedis arteries. The lower extremities were cool to the touch. There was an enormous superficial, collateral circulation between the upper and lower vascular areas, bridging over an obstruction which was visualized röntgenographically—a malformation at the isthmus. If the stenosis is slight or the collateral circulation is adequate, the back pressure on the heart may be easily overlooked. Any excessive exertion or exhaustion may be injurious and therefore they should be avoided.

An Arteriovenous Aneurysm Treated by Ligation of the Left Subclavian Artery.—Charles Noon (*British Medical Journal,* May 6, 1922), reports a case of an arteriovenous aneurysm between the second part of the left subclavian artery and the left subclavian vein, associated with extreme swelling of the left upper extremity. The severe varicose ulceration of the forearm and the marked varicosities of the veins of the forearm made septic thrombosis a dreaded possibility. It seemed inadvisable to attempt a separation of the artery from the vein and therefore a ligation of the first part of the subclavian artery was done, which was followed by recovery of the patient. Success in this operation depends upon the elimination of hemorrhage, shock and sepsis. Hemorrhage is avoided by a careful aseptic technic and careful ligation of the vessel—mere compression and avoidance of dividing the arterial casts by the ligature. To avoid gangrene of the upper extremity, as many of the affected vessels should be saved as possible and sufficient time should be allowed for the establishment of a collateral circulation.

Mitral Stenosis Followed by Death From Cerebral Embolism.—S. Saxon Barton (*Medical Press,* May 3, 1922) reports a case in which a woman aged forty-seven complained of occasional attacks of dizziness accompanied by loss of power in the right hand and inability to speak. There was no other complaint. Physical examination revealed a faint presystolic murmur in the mitral area but not other abnormal physical findings. The condition was treated lightly by the patient and family and after a few weeks she suddenly fell unconscious while attending to her household duties and died shortly after. This case shows that it is advisable not to give a good prognosis in cases of mitral stenosis even if the lesion is apparently well compensated.

An Aortic Murmur.—Thomas Lindsay (*British Medical Journal,* May 13, 1922), recalls that: 1. An aortic systolic bruit is often heard over the aortic cartilage in the absence of any diseased condition. 2. That many such bruits are due to the position of the arms at the time of examination, or rather to the contraction of the muscles of the shoulder girdle. 3. That such bruits mostly disappear with the patient stripped to the waist and the arms hanging loosely by the side.

Pertinent Considerations in Hypertension.—W. W. Sylvester (*Southern Medicine and Surgery*, May, 1922) believes that a diet which is reasonably satisfying and, at the same time, sufficiently poor in salt, is not easy to arrange. Blood and urine examinations are important for controlling the treatment and no pressure is rightly called irreducible unless the daily chloride excretion has been reduced to practically zero. A certain amount of salt is considered indispensable; in normal individuals about two grams, but the limits for nephritics have never been determined. The salt intake must be worked out for the individual. Reduction of the blood pressure to almost or quite normal, may still leave the patient an invalid, either from weakness due to the strict salt privation or, if salt is given, to allow the pressure to go up.

Factors in Prognosis of Hypertensive Renal and Vascular Disease.—O. P. J. Falk (*Journal of the Missouri State Medical Association*, May, 1922) considers that there are three special fundamental factors in the prognosis. The first is the condition of the arterial tree evidenced by the reduction of systolic pressure accomplished by treatment; another fact of importance is that a consistent diastolic reading of over 100 offers a less favorable prognosis than a reading under 100. The second factor is the functional capacity of the kidneys based on the following determinations: a, urine examination; b, phthalein test; c, amount of nitrogenous rentention; d, Mosenthal test for concentrating power. The third factor is the integrity of the myocardium which may be made out by Barringer's method of determination of myocardial reserve by observing blood pressure and pulse rate changes after measured exercise.

Heart in Relation to Habitus.—I. D. Hirsch (*Archives of Radiology and Electrotherapy*, June, 1921) concludes that the position and shape of the heart varies with the habitus, and that habitus must be taken into consideration in estimating cardiac size. Reasoning by analogy, the cardiac function, particularly as regards muscular tonus, may perhaps vary with the habitus. Only by actual measurement of the curves of the heart can the changes in contour be made out in early cases, and the value of the curves varies with the habitus. The radial value of the curves of the left ventricle and right auricle vary with the habitus. The radii measurements are a more accurate and valuable expression of impending or established change in the architecture of the heart chambers than the socalled standard measurements.

RADIOLOGY

Pyelography.—Frank Kidd (*British Medical Journal*, May 13, 1922) asserts that it is absolutely necessary for the urologist to have his own x ray plant. No anesthetic should be used for taking pyelograms. Only one kidney should be done at one time. He insists on using a 5.5 Ch. ureteral catheter with an olive tip. The author's technic in male patients is as follows:

Two drams of a five per cent. solution of stovaine is injected into the urethra and held there for ten minutes. The urethra is then irrigated with a pint of 1:4000 mercury of cyanide solution and the bladder is irrigated by catheter with eight ounces of the same solution. A 24 Ch. single catheterizing cystoscope, armed with the ureteral catheter, is then introduced and the cystoscope is withdrawn. The urine from the kidney is collected in sterile tubes for bacteriological and cytological examination. It is useless to judge the size of the renal pelvis by the amount of urine coming away, as there may be a reflex oliguria or polyuria. The patient now lies on his back with the knees and hips bent. The plate is placed behind the kidney area and the compressor and x ray tube are placed in position, the radiographer making the exposure on command. At that time the patient holds his breath for a few seconds. A syringe is filled with sterilized twenty per cent. sodium bromide solution, beginning with ten c.c., as the normal pelvis only holds six c.c. The patient is instructed to tell at once if he feels the slightest dull ache or pain. If none is felt, one or two c.c. more are injected and the exposure is made. The same amount of solution as was poured in should be aspirated with the syringe and the ureteral catheter should be left to drain. The plate is now developed and if it is satisfactory no further plates are taken. If the shadow is faint and irregular, another plate is taken, this time filling the pelvis first with ten c.c. and if no pain is felt, up to twenty to thirty c.c. If the kidney is infected, it is irrigated with four c.c. of a five per cent. collosol silver with 1:1000 mercury oxycyanide solution added to every nine c.c. of twenty per cent. sodium bromide solution. This should be done only by expert urologists and then not as a routine.

This technic is valuable in diagnosing the normal kidney, congenital abnormalities, dilatation of the renal pelvis associated with Dietl's crises, movable kidney, inflammatory stricture of the ureter following chronic infection or calculi, renal tumors and painless hematuria, for the differentiation of other abdominal tumors, renal pain, calculi and renal infection. Ureterograms help to exclude phleboliths, glands, etc., and impacted calculi. They also show that the pyelitis of pregnancy is due to a ureteral dilatation from the loss of tone in the ureteral musculature rather than to pressure from the uterus.

For cystograms, ten per cent. colloidal silver solutions are used, as the bromide is irritating to inflamed bladders. Bladder pouches are beautifully shown with the cystogram; also the outline of the bladder and prostatic cavities after prostatectomies and the existence of a back flow from the bladder into the kidney from back pressure, using the reversed Trendelenburg posture. A rectovesical fistula was also demonstrated.

X Ray Diagnosis of Echinococcus Cyst of the Lung Simulating Aortic Aneurysm.—Robert Lenk (*Wiener klinische Wochenschrift*, April 13, 1922), reports a case in which a woman, thirty-seven years old, was referred for a röntgenographic examination of her thorax because of dyspnea. Clinically there was only a slight shortening of the breath sounds in the right subclavicular region. The röntgenogram showed the right side of the diaphragm about three fingers' breadth higher than the left, completely movable with respiration. In the upper part of the right lung there was a small lateral zone entirely free and a dense homogeneous shadow as large as a child's head sharply outlined externally and below, not definable from the median shadow above and medially against the second rib in the anteroposterior direction and seemingly superimposed upon the ascending aorta; the trachea and aortic arch were displaced to the left. There was no pulsation and no elevation on swallowing and coughing. On turning the patient slightly to the left, the shadow could be separated from the aorta which was found intact; with further turning it was completely separated. The frontal exposure also showed a circular shadow surrounded by air containing lungs and reaching to the anterior thoracic wall below the apex of the lung. The shadow was spherical and appeared as a part of the lung. The diagnosis rested between a malignant tumor and a cyst. A bronchial carcinoma was excluded because of the free area in the lung; primary pulmonary sarcoma is very rare and metastatic tumors are multiple, leaving the diagnosis of cyst, of which the most common is the echinococcus type. An encapsulated abscess or cavernus was excluded because of the absence of air, the normal structure of the surrounding lung and the existing signs of displacement. Operation confirmed the diagnosis.

Radium in Cancer of Bladder.—G. G. Smith (*Surgery, Gynecology and Obstetrics*, November, 1921), in a study of a series of cases of carcinoma of bladder concludes that it is useless to attempt to cure with radium infiltrating carcinomata which involve large portions of the bladder wall. Necrosis of the bladder will be brought about by any dosage which will materially influence the tumor. Certain superficial cancers of the bladder may be reduced in extent by the application of screened radium emanation to their surface. This may occur without necrosis of bladder wall. To accomplish this effect, 400 millicurie hours, with screening of five tenths millimetre silver, applied not oftener than once in six weeks, has been successful, and has not caused any considerable reaction in the bladder. The greatest effect is produced by the first three or four applications of radium. If the tumor begins to grow again, further treatment with radium applications has little deterrent effect. The best way to employ radium in cancer of the bladder is by the implantation of bare emanation tubes in the tumor, allowing one tube to each cubic centimetre. Steel needles containing radium may be employed in the same way, except that they must be withdrawn after adequate exposure has been made. The necrosis caused by the implantation of radium in bladder tumors persists for at least three months.

Radium in Carcinoma of the Prostate.—H. C. Bumpus (*American Journal of Röntgenology,* May, 1922) concludes that the average duration of cancer of the prostate, if untreated, is approximately three years, and that röntgenograms show that metastasis to the bone occurs in about one third of the cases of cancer of the prostate. Metastasis from a typical carcinoma of the prostate, in which the cells, because of their tendency to early metastasis, produce only slight local enlargement, may be frequently mistaken for Paget's disease. The clinical study of these cases demonstrates that in order to treat successfully cancer of the prostate with radium it is necessary to use in the aggregate large doses (3,000 to 4,000 mg. hours), exposing all parts of the gland to comparatively small doses. It is demonstrated that the increased duration of life following radium treatment in cases of cancer of the prostate is in direct proportion to the amount of radium radiation applied. No one method of application radiates all portions of the gland. The malignant gland must be radiated by urethral and rectal exposures, and by needles inserted directly into the neoplasm in order to produce complete radiation of all portions. It is demonstrated microscopically, that large doses of radium placed directly into the gland affect only a limited area; this is substantiated by the clinical findings which prove that the course of the disease after such treatments is but slightly affected. In the parts of the gland affected by the radium, fibrous tissue is produced which enmeshes and compresses the cancer cells, preventing their further proliferation. If this process could be brought about in the entire growth, complete cessation of the disease would result. Sacral anesthesia is a useful adjunct in the application of radium needles, making it possible to place the radium accurately and to change the position of the needles without pain; thus a more thorough radiation of the gland is accomplished.

Röntgen Ray Stimulation of the Pancreas in Experimental Pancreatic Deficiency.—William F. Petersen and Clarence C. Saelhof (*American Journal of the Medical Sciences,* March, 1922), draw the following conclusions: In experimental pancreatic deficiency due to partial pancreatectomy röntgen irradiation of the pancreatic rest may be followed by a transient increase in sugar output, then by an increase in carbohydrate tolerance. This latter may occur without the preliminary increase in sugar excretion. The increased tolerance may be transient or may extend over a period of several weeks after irradiation. The increased tolerance is not due to the preliminary increase in sugar elimination. When increased sugar elimination is brought about by some other irritant (turpentine abscesses) no increase in carbohydrate tolerance is later observed. The effect on the blood sugar varies. Usually a temporary increase in the blood sugar can be determined, followed by a lowering of the level that takes place in from five hours to several days after the irradiation. When evidences of acidosis exist at the time of irradiation they may diminish or disappear with the improvement in the sugar tolerance. The effect of irradiation on the pancreas is due to direct stimulation of cellular metabolic processes and not solely due to alterations primarily vascular. This stimulation is merely an example of the Arndt-Schulz observation that cell irritants in small doses stimulate metabolic processes. When the irradiation is used in too large a dose, injury to the pancreatic function is apparent in a diminution in carbohydrate tolerance. When tissues other than those containing the pancreatic rest are irradiated no effect is observed on the carbohydrate tolerance other than the primary augmentation of sugar excretion. The titer of the serum diastases, which may be altered by irradiation of the liver, seems to be without influence on the tolerance.

Histological Changes of the Different Types of Carcinoma After Exposure to Radium Rays.—Nicholas M. Alter (*Journal of Medical Research,* May, 1920) observed that different types of carcinoma show characteristically different behavior towards the rays of radium, dependent mainly on the state of differentiation of the different types of carcinoma. The action of radium rays is more effective on the more undifferentiated and embryonic types of carcinoma, while on the differentiated forms, radium has a hastening effect. If the effect of the rays of radium is proportional to the absorbed amount, the nuclei and protoplasm of different types of carcinoma and benign tissue absorb different amounts of the rays.

Chest X Ray Densities.—D. C. Jarvis (*American Journal of Röntgenology,* April, 1922), from a study of granite dust inhalation concludes that: 1. Film densities are like the shifting sand of the sea, and because a density is present at the first examination seems to be no reason for expecting it to be present at a subsequent one. 2. The evidence tends to show that film densities bring into prominence the lung and pleural lymphatics. 3. The same densities are brought into view by various factors, there apparently being no way in which the röntgenologist can determine, without the aid of the clinical history, the exact cause of the densities he is viewing. 4. When other dusty trades are investigated the necessity for serial röntgenograms in studying a chest condition will be more appreciated. 5. There seems to be a definite manner in which densities progress from stage to stage in the development of chest film densities. 6. It is a question whether the röntgenologist should report on the basis of stages with their pathological import rather than on the basis of the causal factor, which latter it would seem is the clinician's province to determine. 7. The usual basis for diagnosing tuberculous activity is seen so many times on films of granite cutters as they leave and reenter the trade, that it hardly seems possible to consider the phenomena more than an indication of a lung working under stress. 8. It would seem that the next step in tuberculosis is the economic one, when by means of wholesale x ray examinations occupations will be determined which produce a suitable preparation of the soil for the development of tuberculosis.

X Ray in Diagnosis of Hilum Tuberculosis.—S. Melville (*Archives of Radiology and Electrotherapy,* November, 1921), states that hilum tuberculosis in the adult would appear to be a definite form of pulmonary tuberculosis, and that such affection can be diagnosed not only clinically but is capable of important confirmatory evidence radiographically. That exaggeration of the shadows at the hilum or peribronchial tissue is of no value *per se* as positive evidence of pulmonary tuberculosis, having regard to the fact that any and every irritative affection of the bronchial tube element will produce shadows of equal density and significance. That the radiographic picture of hilum tuberculosis follows very closely the clinical picture drawn by Rivière and others. That the closest cooperation between the clinician and the radiologist is more than ever necessary if advance in our present knowledge is to be possible. That the radiologist needs to be on guard in his interpretation of the clinical significance of hilar and peribronchial shadows.

Lymphopenia Following Exposures of Rats to Soft X Rays and the Beta Rays of Radium.—J. C. Mottram and S. Russ (*Journal of Experimental Medicine,* September, 1921) report observations on rats given treatment with "soft" rays similar in character to those used by Murphy, supplemented by the use of beta rays of even less penetrating power than those soft rays. The animals showed an initial fall in the number of circulating lymphocytes, provided that the blood counts were made soon after the exposure to the radiation. In view of these findings the terms "destroying" and "stimulating" used by Murphy, may be misleading, sine they are likely to give the impression that different effects are otained after short and long exposures to x ray. The authors have found that the lymphopenia following a large dose may last for a week or ten days, while that following a small dose lasts only a few hours. The lymphocytosis occurring after large or small radiations follows a primary lymphopenia.

Studies on X Ray Effects.—Waro Nakahara and James B. Murphy (*Journal of Experimental Medicine.* April, 1922) report the effects of soft x rays generated by a special water cooled tube with a window of thin glass which will allow the passage of rays usually held back by the thicker glass of the standard tubes. Small doses of the very soft x rays stimulated the lymphoid cells, with probably a small amount of destruction preceding the stimulation. There was also a marked dilatation of the suprarenals, particularly between the cortex and the medulla. Mice treated for one minute by the special apparatus, operated at one half inch spark gap and eleven milliamperes showed a high degree of resistance to cancer transplants, this varying with the time of inoculation after treatment. The resistance was not increased before three days after and was at its highest point ten days after treatment.

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NEW YORK, WEDNESDAY, JULY 19, 1922

Letters to the Editors.

AUTOTHERAPY.

CINCINNATI, *May 26, 1922.*

To the Editors:

In May 3, 1922, issue of the NEW YORK MEDICAL JOURNAL AND MEDICAL RECORD appeared a letter from Dr. Samuel A. Lewin, which states: "In the issue of February 1, 1922, you published a paper by Dr. Thomas M. Stewart, of Cincinnati, Ohio, on Autotherapy, in which credit is given for this form of treatment to Duncan, Waag, Brodin and others. Permit me to inform you, and through you Dr. Stewart, that in October, 1910, Dr. L. D. Rogers, of Chicago, was the first physician to experiment with autotherapy. He employed this method, using the patient's blood, etc." In reply it seems to me that it would be proper for Dr. Lewin to give us the references to the literature to support his plea.

In the November, 1910, issue of the *Chironian* there appeared an article by Dr. Charles H. Duncan, of New York, under the title of Autogenous Virus in the Treatment of Sepsis, although Dr. Duncan had employed autotherapy including blood serum previously to the publication of his first article. About eight years after Duncan's original article, so far as I can determine, Rogers published his first article on the subject of Blood as a Therapeutic Agent. During these eight intervening years there were published many articles by Dr. Duncan and others dealing with the subject of autotherapy, giving full credit to Dr. Duncan, as author and founder of autotherapy.

To the extent of my present knowledge I can say that Rogers never published an article along these lines till he begun in the year of 1918 to publish articles relative to blood as a therapeutic agent. This he called autohemic therapy. I can refer to many medical articles that have appeared in standard medical journals by such men as Kolmer, Fox, Hellario, and Dearborn on the general subject of Blood as a Therapeutic Agent, between 1910 and 1914. These and many more articles published years before 1918, may be found on the subject of blood as a therapeutic agent by any one interested in the subject. I am not aware that Rogers had advocated, much less discovered, the therapeutic use of any other secretion from the body than blood.

In a comparison of *Autotherapy*, by Charles H. Duncan, M. D., with *Autohemic Therapy*, by L. D. Rogers, M. D., I can say that for myself Duncan is clear, while Rogers is involved. Duncan gives exact directions how to prepare filtrates from blood, pus or other secretions for treatment purposes. Rogers does not clearly state his method but gives details only to those who take his course of instruction. Furthermore, Duncan gives credit to those who preceded him in the work and does not enlarge upon his own original work in perfecting a technic that is as simple as the conditions permit and a method of treatment as practical as it is effective in cases in which autotherapy is indicated.

Duncan shows that Lux in 1820 in Germany had the idea when he stated that every contagious disease contained in its secretions the remedy for its cure. This was before the days of bacterial culture. Lux used the discharges diluted and gave the remedy by mouth. Then again, Duncan in his book brings before the reader the works of Jenner, Pasteur, Koch, Wright, Denys and others. He also quotes Gilbert who in 1894 advocated the use of pleural and peritoneal serums in small quantities for therapeutic purposes, and this is autotherapy prior to 1910.

This is quite enough to show that Dr. Rogers was not the first physician to experiment with autotherapy. Dr. Duncan makes no such claim for himself, but does explain in a scientific way the status of autotherapy prior to his own work and gives exact directions as to the details and technic as worked out by him. In conclusion there is an old Latin proverb which says: "Not by whom, but how."

THOMAS M. STEWART, M. D.

PROFESSIONAL STRAIN AND SUICIDE.

NEW YORK, *June 20, 1922.*

To the Editor:

Among the professions of the United States, physicians head the list of suicides for the year 1921. The following figures are interesting: Doctors, eighty-six; judges, fifty-seven; bank presidents, thirty-seven; clergymen, twenty-one; editors, ten; mayors, seven; members of the legislature, seven.

This record seems to indicate that the occupational strain is greater in medicine than in any of the other professions. Should not our scheme of medical practice, as relates to hours and relief, be revised and, if so, how should this be accomplished?

We should be pleased to have you give this matter publicity in order that we may secure a number of replies containing suggestions that may be helpful in a consideration of this important matter.

S. DANA HUBBARD, M. D.,
Director, Bureau of Public Health Education,
Department of Health.

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and
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Eczema*

By H. BROOKER MILLS, M.D., F.A.C.P.,
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Probably no condition of infancy gives the general practitioner and the pediatrist, as well as the dermatologist, more trouble to clear up than eczema. There is also probably no ailment of infancy for which more remedies, largely local, are used, with less satisfactory results.

According to Porter and Carter, the condition may be divided into infantile eczema and seborrheic eczema, the former tending to clear up spontaneously toward the end of the first year, while the seborrheic variety is inclined to persist. The same authors also state that some cases of infantile eczema are the result of the postnatal continuation of the antenatal activities of the skin, which in utero provide the vernix caseosa as a protection against the surrounding amniotic fluid.

In breastfed infants the trouble is in the milk as a whole, while in bottlefed infants it is more often due to one or more of the ingredients of the milk than to the milk as a whole. In support of this statement may be mentioned Czerny's theory of fat metabolism and Finkelstein's salt theory.

However, a number of theories have been advanced other than dietetic, among which may be mentioned thyroid deficiency, external irritation, and disturbance of the nervous system. The most recent theory, and the one that bids fair to produce the best results, is that of food anaphylaxis, which has been extensively studied by a number of investigators, among whom may be mentioned O'Keefe, Shannon, and Sidlick and Knowles.

According to Shannon, who did the protein tests on the backs of the infants instead of the forearms, as is usually done, the dietary treatment in the case of breastfed babies consists of either removing or limiting the offending foods from the dietary of the mother. The question will naturally be asked how long this elimination or limitation of food from the mother's diet must be kept up, and it has been found by Shannon that about three months is necessary, while a child may personally take these foods in from four to six months. A peculiar and interesting point is that, after a baby has been weaned, it is frequently able to eat the foods that had been removed or limited in the mother's diet while it was on the breast, and yet not bring back the eczema.

O'Keefe found that forty per cent. of his patients were cured by the omission from the mother's diet of the articles of food to which the infant was proved to be susceptible, and that twenty per cent. more were definitely benefited. While almost all articles of foods that one could possibly think of have been found to be the offenders, eggs have probably headed the list, and have been removed from the mother's diet even without testing the infant. So many articles have been found to be offenders in a given case that it was not possible to remove them all and keep the mother properly nourished. In those cases some foods would be eliminated entirely and others limited in quantity. It is important for these mothers to eat a large variety of foods, but only a small quantity of each individual food. In this way, while it is true there will be a larger number of protein substances capable of causing trouble, yet the elimination of the small quantities of these foods that were being taken would not reduce the amount of nourishment received by the mother as much as would be the case had she been taking large amounts of them, and at the same time she could be permitted, and should be encouraged, to take more of those foods of which she had been taking but limited quantities, and which did not give a protein reaction.

Intercurrent disease always seems to have an unfavorable effect in these cases, and particularly teething. According to Shannon it is believed some persons acquire sensitization for some foods before birth, but in the majority it is acquired after birth through the breast milk.

In at least one case reported by Sidlick and Knowles the reaction of food proteins was negative,

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*Read before the Logan Medical Society of Philadelphia, May, 1922.

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but was positive to the Staphylococcus pyogenes, the child at that time suffering from an abscess of the cheek, which was found to be due to this germ.

Quoting from Sidlick and Knowles's article: "Reaction to more than one protein in the same patient is a common occurrence. Reactions to test proteins which apparently have not entered into the diet of the patient have also been recorded. Also nonprotein substances, such as apothesine, quinine, and procaine have been found to cause skin reactions. The explanation of these apparent inconsistencies is to be found in the work of Schloss, Wells, and Osborne. Schloss has pointed out the importance of recognizing that many foods are biologically related. Wells and Osborne, from their extensive investigations, concluded that the chemical structure rather than the biological origin of the proteins determines the specificity of the anaphylactic reaction. How nonprotein substances operate to cause skin reactions has not been answered as yet. It has been suggested that chemicals such as arsenic, quinine, and other substances form compounds and alter the proteins of the body in a manner so as to form foreign proteins. Experimental evidence is lacking.

From the preceding it may be inferred that proteins biologically related or chemically similar to an offending protein, though the latter may have been omitted from the patient's diet, may continue to cause the dermatosis. The condition of the gastrointestinal tract may favor or inhibit the absorption of unaltered proteins to which the patient is sensitized and thereby either preclude the possibility of a clinical cure or help to increase the number of clinical cures."

It is undoubtedly true that there are cases of eczema due to fat metabolism, as mentioned by Czerny, the fat intolerance in some cases being sufficiently marked to cause, as he states, pylorospasm, which is proved by the fact that improvement in the eczematous condition promptly follows the feeding of a low fat diet, such as skimmed milk, buttermilk, and melted butter, thus getting rid of the butyric acid. In some cases, however, a reduction in weight would be likely to occur as a result of the elimination or limitation of the fat contents of the food, and at times this may be overcome by increasing the carbohydrate percentage in the food. Sugar intolerance is also a cause in some patients, which promptly improves on its elimination or reduction, and the same is true of protein intolerance, which is largely benefited by boiling the milk. Occasionally, where milk has to be eliminated entirely for a limited period, simple sugar dilutions or cereal decoctions may be employed temporarily with marked benefit.

Chronic Abdominal Conditions Encountered in Adults and Children

The Importance of Their Early Recognition and Treatment in Childhood

By ANTHONY BASSLER, M.D., F.A.C.P.,
New York.

Practically up to the present time it has been the gastroenterologist's attitude in a number of abdominal conditions to consider the case as idiopathic, congenital only at times, and to encompass the condition met with in the life entity of an adult. Yet it is true that many of the conditions he is dealing with began in early childhood and should have been recognized at that early date and treated properly. The same attitude exists among pediatrists, who assume that the vast majority of childen start with an anatomically normal abdomen, with the exception of course of such congenital conditions as imperforate anus, strictured pylorus, etc. The object of this article is to draw attention to the significance of the child start of many of the conditions the gastroenterologist is dealing with in adults, and again to draw attention to these states in children for the pediatrists. With those whose practice is limited to internal medicine or gastroenterology I am not aware of what age the patient must be before he is considered as properly of age for them. With myself it has been the rule not to care for any that are younger than fourteen years, considering these to belong properly in the realm of pediatrics. Nor am I aware of what age the patient should be before the pediatrist considers him more properly to be considered by an internist or gastroenterologist. My own standard of departure was arbitrarily set at puberty, which is thirteen to sixteen years in boys, twelve to fourteen in girls, and in the law of presumptive puberty it was set on the average of boys—namely fourteen years. Considering that the average age of the patient in the pediatrist's practice is quite young, because of the large number of feeding cases in infancy and early childhood, and, on the other hand, that the average person the gastroenterologist or internist deals with is definitely an adult, there seems to be a period in the child's life where he is "neither fish, nor flesh, nor good red herring," from the specialist's point of view. The family physician is in contact from birth on and the significance here may be more worth while with him than debate on lines of departure in the specialties mentioned. Lines of departure in specialties are always overlapping and extending, as can be noted by the proctologist doing general surgery in the abdomen, gynecologists doing laparotomies in disorders above the brim of the pelvis, cardiologists undertaking gastrointestinal work, neurologists doing brain and spinal cord surgery, etc. This is all healthy enough if the work of departure is well done, and it is now apparent that the pediatrist must add to his interest in subjects much that gastroenterology has taught and used in the adult, and the gastroenterologist must have interest in many of the disorders he has to handle in the adult as of more significance in that they should be cared for in early childhood, either by the family physician, the pediatrist, the gastroenterologist, or the internist.

An analysis of ptosis cases in adults suggests strongly that symptoms of the condition were present in the child in many of them. There are many normal individuals with lower than average organs in the abdomen, and there never have been any symptoms attendant upon the condition. A study of ptosis cases strongly suggests that there is no definite symptomatology of ptosis. Those cases that occur are bound up in the physical and vital deficiencies inherent in the individuals, these deficiencies being largely present when the individuals were children, though they were not observed as such, and were not improved; or they may have been somewhat deterred and not become evident until the strain of adult life added its factors of vital reduction which broke the restraining shell, and then the material of which the person is made manifested itself.

Textbooks on diseases of the stomach have emphasized the importance of this subject in the young for years. It is now fourteen years since the following was offered by me (1): "A congenital predisposition to prolapse of the internal viscera is seen in the characteristic body form and fragility of tissue and debility of the nervous energy noted in those individuals in whom these are always existent in the individual all the way from infancy to the grave. A close observation of infants and children has proved to me that the elements of splanchnoptosis are exceedingly common in the young, and the modes of life, methods of feeding, illnesses of infancy and childhood, etc., are conditions causing the continuation or its liability as extra factors. In the light of the judgment that is given to us and the observations that we daily have in the practice of medicine, is it not more logical to suppose that splanchnoptotic conditions or tendencies date usually from the prenatal or early postnatal days of life? Robust parents give birth to the largest proportion of robust children and the progeny of wealthy parents (who have lived along hygienic lines themselves) and whose children when they become adults give birth to children make up the second largest proportion. The parents who give birth to children during the years of the stern competition of life in quest of affluence or those who live lives improper in habits reap almost as many neurasthenics in their offspring as those who are always more or less poverty stricken and are thus compelled to live under unfavorable hygienic conditions with their bad constitutional results.

"Primarily, splanchnoptosis is a status of debility or a kind of chronic neurosis represented in a chronic devitality of the sympathetic system. However pathologically this is produced, it represents to a more or less degree poor tissue soil in early life. Whether this is due solely, as Stiller has suggested, to embryonic defect (*vitium prima formationis*), or to the physical tribulations of the infant and child, or only to acquired conditions in late life, will always remain in the order of a problem and different in each adult case that is seen. The children that are born of poorly nourished parents, or those in whom tuberculosis, syphilis, alcoholism, or chronic disease or status of debility is present, have the largest number of offspring of the poorest quality. Added to these are the mysteriously wrought effects in children of neurasthenic and neurotic parents. Then come such conditions as improper feeding of the infant and child, the living of the child under unhygienic conditions for complete continued health, rachitis with its damaging effects on the nervous, muscular, osseous and ligamentous tissues, more or less mild and unrecognized states of scurvy and the infectious diseases of childhood to which the child is especially prone (scarlet fever, diphtheria, measles, enteric conditions, etc.) and the aftertreatment of which is not considered of much importance in medicine, but which, nevertheless, often leave a legacy, the state and kind of which would cause anxious moments in the adult but which do not receive much attention in the child. Now come the school days with their close confinement and too few moments of outdoor play and recreation, followed by the grind in college, shop or factories, then the wearing incidents in business, homes and in women the bearing of children and dangers of postpuerperal relaxations of the abdominal cavities. Along these lines many of the adults who apparently were born healthy but who, nevertheless, have anatomical splanchnoptosis, finally present symptoms which clinically are associated with visceral prolapse."

Of late, and largely through the study, work and teachings of C. G. Kerley (2), attention has been directed to ptosis in the child as well as to many other abdominal conditions that are constantly encountered in gastroenterological practice in the adult To him largely belongs the credit of awakening an interest among pediatrists and the profession generally. In ptosis, however, to gastroenterology belongs the credit, because those who have worked with these cases have always maintained the early or congenital beginnings. Delayed as this attention is on the part of pediatrists it is most gratifying, now that it is here. There is no doubt that the condition diagnosed in the child will mean eventually fewer cases in the adult, and considering the fact that by proper feeding, abdominal support, massage, conservation of physical energy and the building up of vital strength, so easy to carry out in the child, will mean a marked benefit for health in a considerable proportion of people with ptosis twenty years from now, who are more numerous today than they should be. To this is added the fact that the pediatrist has the best period of life to accomplish permanent results, for work done during the period of growth in skeleton and soft tissue makeup in the child, when these are more plastic and responding quicker in benefits, gives him an opportunity for results that are distinct advantages. Since it is apparent that certain customs, such as excessive drinking of fluids (milk, water) especially when food is in the stomach, and eating bulky and low caloric value foods, are still in vogue in some old ideas of feeding children, it seems they should require modification in these children.

Pylorospasm is commonly met with in the adult. Most often it is judged as symptomatic and reflexly brought about by pathological conditions elsewhere than in the stomach and duodenum, most often in chronic disease of the appendix or minor pathologies like bands and kinks in that vicinity. Pylorospasm second to this is observed as a reflex from spastic conditions of the colon (spastic constipation), this being a concomitant condition associated with chronic intestinal toxemia of anaerobic infections, more particularly those due to the Bacillus welchii, the gram positive cocci and the Bacillus putrificus. Vagotonia, when definitely present, is commonly a resulting state from these infections, and never the etiological cause of the spasticity. With this condition a spastic sphincter ani often exists without local disease in the rectum. Many cases of pylorospasm exist in which there is no definite cause assignable. These have been designated as neurotic, although in my opinion they are expressions of irritative effects on the stomach from dietetic errors.

The importance of pylorospasm in children has been brought to fuller consideration not only by Kerley, but especially by Grulee (3). His latest article draws attention to its frequency, the importance of it as an entity, bringing attention to the fact that it often is a very serious and even fatal condition in children. In the last five cases of marked pylorospasm in the adult without definite disease in the abdomen or biological error in the intestines, four gave a pylorospastic history beginning early in childhood, all becoming intensified as the years passed. Idiopathic pylorospasm is a variable affection, but it can occur in childhood and may continue into adult life. It is important, therefore, that the early cases be recognized, as they would thus be more amenable to treatment, and no doubt some of the adult patients saved.

The condition to which I would definitely draw attention here, and to my knowledge for the first time, are the chronic toxemias in the intestines in childhood. Twenty-one per cent. of several thousand histories in adults show these to have originated in the first decade of life, the average being the eleventh year. Any enterocolonic condition that lasts for a week or more may be assumed as its origin, even if such had been deemed as of simple dietetic origin. For more definite assumption on this is the degree of intestinal trouble or weakness that the child has had, especially if this has been followed by poor health. As Herter has shown, these conditions are common in children, upon which subject Kendall and a considerable group of Boston pediatrists have written well. In so far as the adult is concerned in the studies of intestinal bacteria, many times the same biological pictures are met with as in the young with enteric states. If for no other reason the child is of interest in a gastroenterological way, it is here that its greatest significance is met with. Considering the large number of adults who have this trouble studies should be made of the child in this connection and the condition corrected early in life.

That children are affected with intestinal parasites needs no echo here. Recent studies in tropical countries in addition to hookworm infections, show that the child can harbor about all the parasites that infect the adult. The stools of not a few children whom I have examined show considerable infections in the North, because I have met with the Giardia and even the Entemeba histolytica as well as the pin and round worms. It is more than probable that in not a few adults thus infected their infection really began in early or late childhood and should have been diagnosed and handled at these early years of life.

In the last year I have been studying cases of incomplete rotation of the colon. The marked instances of more or less left sidedness of the right colon have been known for years. But what are far more numerous than these are the just short of complete rotation where the caput cecum, ileocecal valve, and all of the ascending colon occupies its proper anatomical position in the right side of the abdomen but the hepatic flexure is not fixed in proper position posteriorly, is freely movable, and tends to a left sided position. The hepatic flexure of the colon in complete rotation occupies a fixed position in the posterior wall of the abdomen directly under the liver. Numerous instances of lack of this fixed position exist and many of these have been designated as prolapse of the hepatic flexure. But most of these are just small percentages short of complete rotation of the hepatic flexure and proper posterior fixation of it. These no doubt exist in children because they are prenatal in timing and a few of my cases give a symptomatology that dates early in life. In instances of more complete nonrotation, when symptoms occur, they are more matters of adult life and need not be considered here. Why in the lesser degrees of nonrotation the symptoms are more likely to occur in early life than in the more complete cases, is as difficult to say as it sounds unreasonable in comparison between the two. It may be that in the more complete forms the symptoms do not occur until the body is ripe for active reflexes, this being suggested in the fact that studies of the symptoms of these cases in the adult (while often having definite ones like melena, constipation, etc.) are mostly of the reflex order and largely epigastric.

The vast majority of megacolon cases in the adult were present in their childhood. Most of these, however, do not give an early symptomatology and not infrequently it is rather stumbled upon in an x ray examination. Kerley and others have reported some, however, causing abdominal distention and malnutrition, and if the adult cases could have been diagnosed early no doubt these would be less troublesome in adult years.

There is no doubt that loops of the colon and redundancy of the sigmoid existed in childhood in the cases we see in adult life. Without definite assertions on the part of surgeons and gastroenterologists as to when they did occur in the case under analysis far too many have been and still are being considered in an idiopathic and symptom producing way and too much surgery is being engaged in in this anomaly. An occasional case may warrant it, but when one handles them in detail and persistently in medical ways most of them are improved sufficiently well. This being true with the adult, it is all the more significant that these cases were diagnosed early in life, and dietetic, massage and other directions employed early.

The symptoms that should awaken investigation in the young are varied, but they can be grouped as follows: paroxysmal pain in the abdomen, mostly in the epigastric region; obstinate constipation or tendency to loose movements of the bowels; intermittent or more or less constant distention of the abdomen (pot belly); recurrent vomiting; steady anorexia; acidosis attacks; anemia; malnutrition and irritable disposition.

The list of disorders in the abdomen that the gastroenterologist is handling daily in his work have their analogues in children. Most of the adult patients he sees had the same condition in childhood. This being so and such children arriving to adult years in good and fair nutrition and general health whether no symptoms of the disorder existed during childhood, or such that did exist being minor and easily handled, warrants the gastroenterologist in assuming that only an occasional one of them should be considered as surgical disorders. Much can be done for them medically in adult years, and still more for the same disorders in childhood. It is therefore important that these cases be diagnosed as early in life as possible, preferably during childhood. Those cases that escape the pediatrist or the röntgenologist in these early days should be watched for by the family physician who should have more of such children examined by x ray than today is thought necessary. On him more than on the pediatrist (who may not see the case because of the absence of symptoms or the presence of minor symptoms which are quickly controlled, and the gastroenterologist who sees them late in their lives because they had existed almost throughout the course of the individual life) should hope that they would have been diagnosed before he sees them. Many of such would have been saved more or less illness in early life, would have had less symptoms when adults, and not a few real abdominal cripples in late life would have been far short of that status of semiinvalidism.

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21 West Seventy-fourth Street.

Two Cases of Subdiaphragmatic Abscess Complicating Appendicitis

By W. BERNARD KINLAW, M.D.,
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Case I.—A boy, G. R. W., aged eight years, was admitted to Dr. Ashhurst's service, in the Episcopal Hospital, on January 16, 1921, at 11 p. m., with a diagnosis by the family physician of empyema. The history of the case is as follows:

The family history was negative; personal history included whooping cough at seven years, and occasional colds; no other diseases, no operations. The chief complaint was cough and dyspnea. The patient was perfectly well, with the exception of a slight cold, until three weeks ago (December 26, 1920) when he was taken with pain in the upper abdomen. This pain came on gradually, was dull in character, not relieved by pressure on the abdomen, not radiating to the back, side, or lower abdomen. The next day the pain continued, not severe but annoying. A dose of castor oil was given but returned, and there developed a slight, hacking, nonproductive cough. The mother thought he had had no fever, and the condition remained about the same, the boy having little appetite, staying in bed part of the time and being up part of the time, apparently in this state for the following two weeks.

Twenty days after the onset the condition became much worse. The cough became much more severe, at times nearly causing exhaustion. A yellowish frothy sputum with a foul odor was coughed up. The patient's breath was also foul smelling and there was marked dyspnea. He did not complain of abdominal pain. He vomited everything he had eaten and vomited and gagged after a severe coughing spell. He was seen by the family doctor, who said he thought the child had empyema and should go to the hospital.

On admission the boy was poorly nourished and extremely sick, with rapid and labored respirations, attacks of violent coughing, very foul breath, and somewhat cyanotic. There were enlarged veins under the eyes and over the chest and abdomen. The temperature was 104° F., respirations 48 a minute, pulse 144. The pupils were slightly dilated, reacted to light and accommodation, eyes somewhat sunken.

The tongue was heavily coated and there was a very foul breath. The veins of the neck were prominent, pulsation of the carotids was visible. There was a bulging of the interspaces on the right side, expansion was more marked on the left side. The apex beat was faintly visible and felt in the fifth interspace, one and a half cm. to the left of the nipple line. On percussion the left lung was resonant throughout. The right chest presented dullness both anteriorly and posteriorly, below the third rib. It was resonant above the third rib. The heart was apparently pushed to the left. There were crackling râles of all varieties throughout the left chest and upper part of the right chest. The breath sounds were much exaggerated over the left side. The right side, above the third rib, presented exaggerated breath sounds, and crackling râles. Below the third rib the breath sounds and voice sounds were much diminished.

The abdomen was slightly distended. There was no rigidity or tenderness except on deep palpation in upper right quadrant where there was slight tenderness. No masses were palpable. The liver extended two and a half cm. below the costal margin. The spleen and kidneys were not palpable. The bladder was not distended.

This patient came under my care in the receiving ward; and believing the family physician's diagnosis of empyema to be correct, and after consultation with Dr. Ashhurst over the telephone, a needle was inserted at the angle of the scapula, in the seventh right interspace, in order to relieve the urgent symptoms. After the needle had gone in about two and a half cm. a greyish, purulent material was withdrawn, having a foul odor, not the odor of colon bacillus however. The needle was then attached to an aspiration outfit and 580 c. c. of pus was evacuated. Following the removal of pus the coughing stopped entirely, the cyanosis became much less marked, respirations much improved, the child was able to lie down (which he could not do before without a violent attack of coughing with marked cyanosis) and he was apparently much better. The child soon went to sleep and slept until about 7:30 the next morning (about eight hours) when he became restless, the pulse was very weak. The boy died at 8:30 a. m.

A necropsy was performed, for the report of which I am indebted to Dr. C. Y. White.

The pathological diagnosis was: Bronchopneumonia, acute pleurisy (fibrinous), subdiaphragmatic abscess, gangrenous appendicitis, localized suppurative peritonitis, acute diffuse nephritis and acute toxic splenitis. The appendix was about seven cm. in length, was retrocecal, and pointing toward the liver and gangrenous. From it ran a straight tract, which terminated in a large subphrenic abscess, which was intraperitoneally situated in the right posterior intraperitoneal subphrenic space. About one hundred c. c. of pus still remained in the abscess cavity, which by the adhesions was apparently of about two weeks' duration. The needle, which supposedly was passing through a thickened pleura, had perforated the diaphragm without entering the pleura and gone into the abscess cavity, which was bounded above by the diaphragm, below by the upper surface of the posterior portion of the right lobe of the liver, in front by the right lateral ligament and on the left by the reflection of parietal peritoneum covering the right surface of the vena cava.

In 1914 Dr. Ashhurst had admitted to his service another case of appendicitis, complicated by subphrenic abscess, which, as it has not been reported before, is included in the present report.

Case II.—A boy (J. M.) eleven years of age, admitted November 13, 1914. The family history was negative. The patient had had an attack, similar to the present one, three years ago. Four days before admission the child was seized with cramplike pains in the abdomen, following an indiscretion in diet. The pain was at first generalized over the abdomen but later became localized to the right iliac fossa. The bowels were constipated, and the patient vomited after the beginning of the pain. There were no pulmonary, cardiac, or genitourinary symptoms.

The physical examination was negative except the abdomen which was somewhat distended throughout; liver and spleen not palpable. On light palpation there was some rigidity and tenderness in the right iliac fossa. By pressure there was evidence of a mass in the same locality. Peristalsis was active throughout, and there was gurgling in the right iliac fossa. There were no scars, or hernia. The external genitalia were negative. The temperature was 99° F., pulse 128, respirations 24, urine negative.

A diagnosis of acute appendicitis with abscess formation was made, and Dr. Ashhurst operated immediately, finding an appendiceal abscess with a gangrenous and perforated appendix. The appendix was removed and the abscess opened and drained, a rubber tube was placed to the pelvis and an iodoform drain to the stump of the appendix.

The boy was put in the Fowler position, and was given continuous enteroclysis. He did quite well, having the drains removed in a few days, temperature and pulse being normal. He continued to improve until the eighth day after the operation when his temperature rose to 101° F. and his leucocytes were found to number 27,500, of which eighty-one per cent. were polymorphonuclear. The next day his temperature was still high.

The operative incision was healed except for a superficial granulating area in its lateral half, there being no sinus and no discharge. There was no tenderness here or elsewhere except high in the right loin, over the lower right ribs and at the costal margin in the midaxillary line. There was slight but distinct pitting of the skin on pressure over these regions, but none elsewhere. On deep inspiration it appeared that the right costal margin moved further away from the midline than did the left (Hoover's sign). The lungs were negative.

A diagnosis of subphrenic abscess was made, and operation done the same day, November 22, 1914. A finger inserted into the incision of the first operation, found no pus pockets here, but dense adhesions walling off the right flank. So a small gridiron incision was made at the edge of the ribs in the midaxillary line. When the thickened peritoneum was opened, the ascending colon presented. This was packed off, and a subphrenic abscess between the liver and diaphragm was evacuated by burrowing upward with the finger. It contained about fifty c. c. of creamy inodorous pus. The culture showed short chains of streptococci. A tube was placed for drainage and the wound drained for several days. The temperature gradually subsided and the boy made a good recovery and was discharged with both wounds healed entirely, twenty-four days after the second operation. When seen nine months later he was free from symptoms.

COMMENT (1).

The statistics of Lance (1909) on subphrenic abscess comprising almost one thousand cases indicate that about twenty per cent. are caused by appendicitis, thirty per cent. by lesions of the stomach and duodenum, thirteen per cent. by lesions of the liver or gallbladder, and thirty-seven per cent. by miscellaneous affections (pancreas, spleen, large intestine, pleura and other organs).

Appendicitis may give rise to subphrenic abscess in various ways. It occurred in twenty out of one series of 2400 cases of appendicitis under the care of Dr. John B. Deaver, four of the patients recovering. The intraperitoneal variety was present in two thirds of 106 cases analyzed by Eisendrath. He found recorded only six left sided cases of subphrenic abscess due to appendicitis.

According to Barnard, who fully discussed the subject in 1908, special attention should be paid to the following points in diagnosis:

1. Previous history (usual causes of the condition, *e. g.*, gastric or duodenal ulcer, appendicitis, hepatic abscess, or other conditions).
2. Character of onset.
3. Constitutional signs of pus.
4. Abdominal signs and symptoms, including bulging during respiration, tenderness, rigidity, dullness or tympany due to perforation of air containing viscus. A swelling due to subphrenic abscess is immobile because fixed by adhesions.
5. Thoracic signs and symptoms. Most important are dullness, associated with upward displacement of lung; diminution or absence of breath sounds, vocal resonance and vocal fremitus. Amphoric resonance of abscess contains air. Apex beat of heart may be displaced upward but seldom laterally. Hoover's sign is of value in differentiating between empyema and subphrenic abscess (if the abscess is subphrenic the excursion of the costal border on the affected side is increased, being decreased on the affected side if due to empyema).
6. Fluoroscopic examination shows fixity or lessened mobility of the diaphragm on the affected side.
7. Aspiration is dangerous unless followed by immediate operation, therefore should not be done until patient is ready for any operation that may seem proper.

In the first case reported herewith, the subphrenic abscess was in direct continuity with the gangrenous appendix; in the second case, as is more usual, the abscess appeared as a secondary complication, probably being due to direct spread of infection before or during the original operation. If the subphrenic abscess is due to spread of infection along the retroperitoneal lymphatics it seldom gives rise to symptoms so soon after the first operation. Two other cases of appendicitis complicated by subphrenic abscess have been reported by Dr. Ashhurst (2); in the first of the subphrenic abscess developed before operation, from direct intraperitoneal spread of infection; in the second it did not develop until six months after operation. In the total four cases, two patients recovered and two died. These were observed in a series of two hundred cases of appendicitis with complications (abscess, diffuse peritonitis, gangrene, etc.) requiring drainage of the wound.

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Congenital Diaphragmatic Hernia

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From Holt's *Diseases of Infancy and Childhood* we get the following paragraph:

"Diaphragmatic hernia is due to a congenital deficiency in the diaphragm, which is usually on the left side. Of 118 cases collected by Livingston, eighty-three were on the left side, eighteen on the right, four were central, two were double, in one the diaphragm was absent. With small openings only a single coil of intestine, with large ones a considerable part of the abdominal contents may be found in the thorax. This causes displacement of the heart, usually to the right side, prevents the full expansion of the left lung, and if the deformity occurs early in intrauterine life the lung may remain rudimentary. If a large deficiency exists, infants may live but a few hours; with smaller ones, life may be prolonged indefinitely."

The symptoms noticed soon after birth are usually cyanosis, rapid respiration, a sunken abdomen, an overdistended chest, and dyspnea. Infants often live but a few hours. In those who survive a longer time dyspnea is generally the most prominent symptom. It may be constant, it may occur in severe paroxysms, or there may be attacks of cyanosis often of great severity, these being produced by an accumulation of gas in the stomach or in the thoracic part of the intestine. Other symptoms may at times suggest intestinal obstruction. The physical signs vary from time to time. Sometimes those of pneumothorax are present; at others there is so much dullness with the feeble respiratory sounds, as to suggest fluid. The signs are usually upon the left side, with displacement of the heart to the right. A positive diagnosis can often be made by means of the x ray after the administration of bismuth. The condition is not amenable to treatment.

CASE.—S. R., aged twenty-four, secundipara. Family and personal history both were negative, and venereal history was denied. Menstrual periods began at the age of fourteen and was of the twenty-eight day type, the flow lasting from four to six days at each period. She was married at twenty-one years of age, and a normal male child was born one year later. The pregnancy, labor, and puerperium were normal. The last menstrual period was on February 20, 1921. There were no untoward symptoms during the pregnancy. Labor commenced on November 16th at 5 p. m. As soon as the patient realized she was in labor she went to the Swedish Hospital. The abdominal examination showed the fetus in a left occipitoanterior position; the fetal heart being heard in the left lower quadrant beating at the rate of 128 a minute. The vaginal examination confirmed the abdominal diagnosis. The three stages of labor were rapid and uneventful, delivery taking place at 8:30 p. m., three and a half hours after the first labor pain.

Upon being born the child gave a little gasp and a faint cry and made a forced attempt at inspiration. With every attempt at inspiration the intercostal and subcostal spaces would retract, the shoulders heaving upward, and the thighs and legs flexing upon the abdomen. I aspirated the mucus from the child's mouth and pharynx with a catheter, held the child feet up, slapped its back, threw a handful of water on its chest, but could get no deep inspiration or cry. The labored and forced efforts at inspiration as described above were evident. Suspecting a mucus plug in the larynx or trachea I passed a catheter into the child's larynx to aspirate any mucus that may be present but the larynx and trachea seemed clear. (I had inserted a catheter into the trachea in two previous cases of asphyxia neonatorum with immediate and excellent results.) I tried all of the described methods of artificial respiration but none seemed to relieve the progressive and increasing asphyxia, the only result being the forced attempts at inspiration.

The child was becoming quite cyanotic and I resorted to oxygen inhalations. Soon after the administration of oxygen the cyanosis disappeared and the child assumed a healthy color in spite of the inefficient respirations. The tugging and labored efforts at inspiration persisted. As long as I kept the child in a basin of water at body temperature and supplied it with oxygen the color remained good, but as soon as I took the oxygen away the cyanosis returned. The respirations at this time were about eight to the minute. If, during the administration of oxygen I pressed upon the abdomen to prevent any oxygen from entering the stomach, the cyanosis would at once return.

The point of greatest intensity of the heart sounds was in the right anterior axillary line at about the fifth interspace. The apex beat could be felt distinctly in this area. The heart rate was about forty-five a minute. The efforts at inspiration gradually became weaker and less labored and the child died an hour and a half after birth.

The only external physical defect present was a marked right talipes equinovarus and to a less degree a left talipes equinovarus. A premortem diagnosis of congenital atelectasis with transposition of the organs was made. Dr. L. A. Thunig, attending pathologist at the Swedish Hospital, performed the autopsy.

On opening the abdomen the liver was found much enlarged and filling the greater part of the abdominal cavity. The only other visible content of the abdomen was the sigmoid which was well filled and distended with meconium. The descending colon disappeared through a slit in the diaphragm caused by the separation of the diaphragm from the posterior abdominal wall. The opening about one quarter of an inch to the left of the aorta. On removing the anterior chest wall the thorax was found filled with small intestines right up to the neck. It also contained the whole stomach and the large intestines. The heart and lungs were not visible. On pushing aside the small intestines from the right side of the thoracic cavity the pericardium was exposed. The apex corresponded to the fifth interspace in the anterior axillary line. The lungs were rudimentary and occupied the posterior part of the thorax. The diagnosis was left sided congenital diaphragmatic hernia.

Dr. Thunig reports having seen a case of left sided congenital diaphragmatic hernia in which the infant lived nine days. The most prominent symptoms in his case were dyspnea during and after nursing and also during defecation. An enema would materially reduce the degree of dyspnea and cyanosis. The dianosis was made during life.

A premortem diagnosis of left sided congenital diaphragmatic hernia could have been possible in my case on account of the dyspnea, displaced heart, and especially upon the increased cyanosis when pressure was exerted upon the abdomen forcing the meconium from the sigmoid in the abdominal cavity into the descending colon in the thoracic cavity.

Acute Abdominal Conditions in Children*

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The difficulties which attend the differential diagnosis of acute abdominal conditions in children were thoroughly impressed upon me, when during the past few weeks I was called in consultation in several cases of acute surgical disease of the abdomen. The ages of the children ranged from three to twelve years. In the younger children, on account of indefinite subjective information, it was difficult to arrive at a diagnosis. In these cases one must use a combination of the objective findings and a certain amount of intuition which can be acquired only through long experience derived from previous training in general practice. The general inspection then of the child, in addition to other physical signs, must evidently mean more to him even than the history given by parents and the meager information derived from the patient. The desire of the little patient to hide symptoms on account of fear, and not infrequently persistent crying, naturally cause the abdomen to become rigid and add more difficulties to the final diagnosis of the case.

The opinion expressed before, that the best single differentiating sign between appendicitis and pneumonia is the playing of the alæ of the nose, has again been proved during the past winter. This sign is rarely found in the early stages of appendicitis, while it is always present in pneumonia before even a demonstrable lesion is found in the lungs.

The first case which demanded our attention was one which required the finest judgment both in the determination of the diagnosis and in deciding whether the operation should be performed at once, or delayed on account of a spreading peritonitis. The diagnosis as to the particular kind of infection was not easy, because six weeks before the abdominal condition presented itself there was a history of pharyngeal diphtheria. The patient was a female, five years old, very intelligent and ready to assist us in making a diagnosis. It was evident that an abdominal condition was present, but on account of the generalized tenderness of the abdomen, with a little more rigidity in the right iliac fossa than in other parts of the abdomen, a definite diagnosis was difficult. While we considered that appendicitis was the most frequent of all acute abdominal conditions, still on account of the patient's previous history of diphtheria, a diagnosis of diphtheritic or pneumococcic peritonitis was made with a possibility of appendicitis, although we did lean more strongly towards the former. An added reason for making this diagnosis was the resemblance of the picture presented to those cases in which in the past operation had been performed.

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The treatment is as perplexing as the diagnosis, inasmuch as most surgeons are agreed that it is best to wait until the pus has become localized before operating on these patients. If the pus should show a tendency to localize they will recover, but if there is no tendency to localization, then the waiting policy does absolutely no good. The mortality in such cases is exceedingly high. In every case of pneumococcic peritonitis in which we had operated the patient died, with the exception of the case under discussion. On account of the fatal character of this infection I believe the best policy is to operate as early as possible. In these cases we have operated at all stages, and it would seem that if they could be seen early enough prompt surgical intervention would give the best results. A writer on this subject made the statement recently that if these patients were operated upon early enough a great many of them could be saved. In our case the patient was operated upon about twenty hours after the onset of the abdominal symptoms. Upon opening the abdomen a large volume of pus exuded, most of which was in the pelvis; the appendix seemed normal, but was removed. A large sized tube was inserted in the pelvis, the patient placed in the Fowler position and received salt solution by bowel. The bacteriological examination confirmed our diagnosis.

When a child is sent to the hospital with a diagnosis by a physician special care must be given either to confirm or disprove this diagnosis. While we are well aware that pneumococcic peritonitis is much more common in girls than in boys, yet when a boy five years old was sent to the hospital, with symptoms identical with those presented in the previous case, we made a diagnosis of pneumococcic peritonitis. The patient was admitted with a diagnosis of meningitis, but on account of the preponderance of abdominal symptoms we were asked for an opinion. He was very sick, toxic, emaciated, with dry coated tongue, eyes sunken, sordes around the corners of the mouth. The abdomen was rigid throughout, tender and slightly distended. There were no physical signs of meningitis at the time our examination was made. An operation was performed. The abdomen presented the characteristics of a late generalized peritonitis, the intestines being matted together. The pus was localized in the pelvis; the appendix was apparently not the cause of the infection. Slides made from the pus revealed a mixed infection of streptococcus and pneumococcus with a preponderance of the former. We realized that this patient was more seriously ill than the former, and our prognosis was made accordingly. He died within a week after operation, notwithstanding supportive measures, hypodermoclysis, stimulants, and antistreptococcic serum. Immediately after death the tonsils were excised, the pus was cultured and revealed streptococci. The tonsils may have been the source of infection.

It takes much courage to disagree with estimable physicians in a diagnosis when the differentiation must be made between appendicitis and some other intraabdominal condition. This occurred in two instances when in consultation with well known pediatrists and again with a general practitioner who does good surgery. The first patient was a boy about ten years of age. The history revealed that he had some abdominal pain with a little tenderness in the right iliac fossa, which was especially well marked on rectal examination. In the presence of appendicitis a rectal examination is good confirmatory evidence, but where it does not exist a rectal examination may lead to erroneous conclusions. When I examined this boy there was no rigidity or tenderness, pain was absent, the patient being in absolute repose. Operation was not advised. The following day a diffuse urticaria developed. In the second instance there was considerable controversy as to whether the condition was pulmonary or abdominal. It was impossible to detect any signs of pneumonia. The abdomen, however, was rigid, and the child was plainly suffering from an appendicitis of several days' duration. Operation confirmed our diagnosis. In this case drainage was necessary. In another instance the case proved to be one of gastroenteritis following an indiscretion in diet.

When fat or robust children are seized with sudden pain in the right iliac fossa followed by the cardinal symptoms of vomiting and rigidity, one must give the closest consideration to these manifestations in individuals of this type, because the appendicitis is usually of the fulminating type, gangrene ensuing in a comparatively short time. In one case, the patient was a plump child twelve years of age. She had complained of pain on the right side in the early morning hours, followed by the characteristic symptoms referred to above. On examination, while there was still some rigidity left, subsidence of symptoms had occurred. On account of past experience with a case of this type we advised operation which was accordingly performed a few hours after the consultation. We found a somewhat swollen appendix, with numerous seat worms scattered over its mucous membrane, the surface of which was covered with petechial hemorrhages. While delay of operation cannot always be ascribed to the tardiness of the physician, I am sorry to admit that many cases reach the surgeon too late. There is no excuse for the many gangrenous appendices and the many pus cases that we encounter. When the physician is in doubt a consultation can always be arranged in a comparatively short time. A long convalescence can be substituted by a stay in the hospital for from ten days to two weeks. Today the public is better educated and is alive to the fact that appendicitis is a surgical condition. Still there are many instances where we encounter parental objection and concealment of the child's symptoms from the physician. Home treatment of appendicitis cannot be too much deprecated and discouraged, as illustrated by the following case:

The child, a boy, ten years of age, presented symptoms of a spreading peritonitis and marked rigidity in the right iliac fossa. He was toxic and the case was considered one of the severest types of appendicitis ever encountered in a child. At operation the appendix was found gangrenous, an abscess was situated in the pelvis and gallbladder region. The wound was practically left open, and several tubes and Mikulicz drains were employed. For one week this child hovered between life and death, subsisting solely on albumen water by the mouth and Murphy drip by the bowel. He was vomiting at intervals during this entire period and the abdomen was distended. He looked very sick. His facies resembled somewhat those found in intestinal obstruction, but the rapid pulse, the sunken eyes and anxious expression quickly changing to that of impending death were absent, and the dusky hue so often found in mechanical ileus was absent. The pain was continuous. All these symptoms being present, the condition had to be differentiated from a general suppurative appendicitis, but this was excluded as the perpetual wakefulness and bright alert eyes, and the persistent distention of the abdomen with the glasslike and dusky hue were not present; the child had many naps during the day and night. While much has been written on the beneficent effect of morphine in general peritonitis we have seen no curative effect. On the contrary, it prevents excretion, and interferes with normal interchanges necessary to determine state of patient. The patient had a stormy convalescence but recovered.

The greatest diagnostic acumen must be exercised in children from one to three or five years of age. In the past season we have operated on several children around the third year of life for abdominal conditions, especially appendicitis. Strange to say the first physician called missed the diagnosis in each instance, perhaps because the symptoms were not sufficiently localized, the case being considered a simple gastrointestinal attack. The only sign that distinguished these cases from a gastrointestinal attack was the persistent rigidity in the right iliac fossa. If this alone is found it may be considered sufficient cause for operation in the absence of all other phenomena. The temperature, pulse and leucocyte count are simply confirmatory, greater credence being always given to physical signs. In these young patients it is especially important to differentiate their symptoms from pneumonia. Though this seems at times impossible it can be done if we bear in mind certain cardinal points which characterize both conditions. Rigidity of the abdomen, in the absence of rapid breathing and playing of the alæ of the nose and the flushed face, stamps the case appendicitis.

Probably the most perplexing acute abdominal condition is the presence of gallstone colic in children. These cases are not suspected because they are rare, but we must be mindful of their existence, the most important point being the seat of the pain and the presence of rigidity higher up on the abdominal wall under the costal border. These patients had the characteristic colic found in adults, which was only relieved by morphine. In both of the children at operation the gallbladder was found to contain many stones. It was much thickened which necessitated its removal. Both patients did well and are still in the best of health.

With one exception we have been considering successful cases. Two cases were referred to the surgeon too late for operation. One of the patients was treated for ptomaine poisoning for several days before being sent to the hospital. It was truly a case of poisoning, without the ptomaine however.

In the second case the child complained of headache, the abdominal symptoms not appearing prominently until the next day when she told her playmates of pain in the abdomen. When the family physician was called too much stress was put on the head symptoms and not enough on those of the abdomen. When I was called in consultation an advanced general peritonitis was present in both cases.

The symptoms in both these cases may be considered together as they were identical. Both children had distended silent abdomens, absolutely no peristalsis being heard; the respirations were rapid, 40 to 50 a minute. In both cases the abdomen was generally tender, the expression was anxious, wakefulness was the rule, the pulse was good, rapid, bounding at first then weakening, the complexion was florid at first, then gradually becoming dusky, until the facies looked green before death.

It is still a mooted point among surgeons as to the best time to operate in a spreading peritonitis, but I do not believe there can be any doubt in the mind of any surgeon as to the proper course to pursue in the last two cases mentioned. The great majority of these cases are fatal and it seems to make very little difference whether we wait until the supposed localization of pus takes place or if we operate at once. Most surgeons agree that it is best to wait in a case of spreading peritonitis, but we have never seen a patient recover who had general peritonitis of colon infection. To illustrate this point a little more fully I called in consultation another surgeon who advocated the waiting policy in cases of general peritonitis, namely, the Ochsner treatment. We were absolutely opposed to operation in this case. Much to our surprise our consultant advised operation. The patient died about twelve hours after operation. Closely following this case another of the same type came under observation. For purposes of comparison my friend and surgeon was again called in consultation. He advised waiting until localization of pus had taken place. This was consistent with his views. As stated before this patient died, which helps to confirm our conclusions that when general peritonitis of certain types is well established treatment of any kind is of little benefit.

In conclusion, the difficulties of diagnosis of acute abdominal conditions in children must be apparent to all. While appendicitis is the most frequent affection one must always bear in mind other types of infection especially that due to the pneumococcus. The decision as to whether the case should be operated in early or late will depend on the duration of the ailment and the experience of the surgeon.

Furuncles of the Ear Canal

A Report of Ten Cases of Furunculosis of the Posterior Portion of the External Auditory Canal Occurring in Children and Simulating Acute Mastoiditis

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One of the common diagnostic pitfalls in the ear diseases of children is the differentiation of an obscure or an atypical case of furunculosis of the canal from an acute mastoiditis. Furunculosis of the external auditory canal, described by various authors as acute circumscribed external otitis (otitis externa circumscripta acuta), otitis externa circumscripta, or just plain furuncle of the auditory meatus, is due to an infection of a hair follicle or a sebaceous gland. The inflammation is found mostly in adults, but may be found in children. Because of the comparative rarity of the incidence of this disease in infants and young children and its consequent easy confusion with acute mastoiditis, this paper is presented, reporting ten cases occurring in children under five years of age.

Kerrison (1) divides the etiology into two divisions, predisposing and exciting causes. Under the head of predisposing causes he includes constitutional and general factors. Under the head of exciting causes he includes local infection, either from a purulent discharge from the middle ear, or from an abrasion caused by external irritation. This classification, though a simple one, is not sufficiently inclusive, and does not cover all the possible etiological factors. Therefore, a different classification is here offered, consisting of four divisions: 1, External or mechanical; 2, internal or aural; 3, general or constitutional; 4, reflex or trophoneurotic.

CLASSIFICATION.

The external or mechanical form of infection is the most common, and is caused by scratching, probing or traumatic cleaning of the ear during the removal of cerumen or foreign bodies by instrumentation or irrigation. The internal or aural form of infection is next in importance, and is caused by a prexisting middle ear suppuration or infected chronic eczema. The general or constitutional form of infection is relatively uncommon, and as a rule it acts as a predisposing factor and is associated with one of the other forms of infection. Any debilitating disease, and particularly diabetes, gastrointestinal disorders, rheumatism or gout may be responsible. Hunter Tod (2) mentions the extensive use of bromides as an occasional cause. The reflex form of infection was described by Urbantschitsch (3) who, as quoted by Dench, "reported instances where a derangement of the trophic nerves of one side, due to a local lesion, was followed quickly by the development of a furuncle in that portion of the canal of the opposite side, supplied by the corresponding nerve." Dench (4) supplements this by a report of two cases of his own, one in which a boy had a severe traumatic external otitis of one ear, and though he was in an excellent general physical condition, an abscess developed in exactly the same location in the canal of the other ear. In the other case the abscess in one meatus was followed within twenty-four hours by an exactly similar condition in the same location of the meatus of the opposite side. Because of the identity of the locality of these abscesses and the absence of any other exciting cause he places these furuncles in the reflex trophoneurotic group.

SYMPTOMATOLOGY.

The symptoms of furunculosis of the meatus are a feeling of fullness in the ear, itching in the ear, pain, deafness, tinnitus, difficulty in mastication, sleeplessness, tenderness of the auricle or tragus, swelling of the skin in and about the ear, glandular enlargement, tenderness over the mastoid or parotid gland, protrusion of the ear away from the head, edema over the mastoid, redness or purplish discoloration of the skin in front of the tragus and fever. In infants and young children the subjective symptoms are, of course, not to be obtained and the diagnosis is consequently difficult. The intensity and the frequency of the symptoms are dependent upon the locality and the size of the furuncle. This is best understood by reference to the anatomy and pathology of the structures involved.

ANATOMY AND PATHOLOGY.

At birth the external auditory canal shows no osseous portion, but is simply a fibrocartilaginous slit. After birth the differentiation into an external cartilaginous and an internal osseous portion begins in two ways. First, by the deposition of newly developed bone around the tympanum, the anterior, the inferior and most of the posterior wall are formed and secondly, by the bending inwards of the outer plate of the squama the superior wall is formed. The completion of the osseous canal is usually accomplished during the first year. The fibrocartilaginous portion contains numerous hair follicles, sebaceous glands, and ceruminous glands. These glandular structures are not found in the osseous portion and therefore furunculosis of the canal is limited to the external portion. A swelling situated on the posterior wall in the internal bony portion of the canal, especially if superiorly, should be considered as an extension from the mastoid cells, as in this locality the antrum is separated from the canal by only a very thin plate of bone. In adults the differentiation of a furuncle in the cartilaginous canal from a tumefaction in the osseous canal is usually not difficult, but in infants with a narrow lumen, a short and imperfectly developed bony canal and a furuncle low down in the fibrocartilaginous portion this distinction is a most difficult task, and herein arises the confusion between acute mastoiditis and furunculosis.

The anterior wall of the cartilaginous canal is crossed by the fissures of Santorini, which lend mobility to the ear and drain the parotid gland. Through these fissures, when the furuncle is located on the anterior wall, the infection from the ear travels to the parotid and we have the consequent parotid gland swelling and tenderness.

The feeling of fullness in the ear, the itching, the deafness and the tinnitus depend on the degree of obstruction. The pain upon mastication is due to the intimate relation between the tragus and the intermaxillary articulation. This sign when found is pathognomonic. The sleeplessness is due to the pain, the intensity of which depends on the depth of the inflammation. The displacement of the ear anteriorly is due to the postauricular swelling.

DIFFERENTIAL DIAGNOSIS.

The differential diagnosis of furunculosis of the external auditory canal is between exostosis, aural polypi, granulations of the external meatus, perichondritis of the auricle, carious teeth, parotid abscess and acute mastoiditis. The difficult differentiation is from mastoiditis, and will be treated in detail a little later. The other conditions can be dispensed with in a few words. An exostosis is a bony prominence, therefore hard to the touch and usually not sensitive, whereas a furuncle is soft to the touch and very sensitive. A polypus is freely movable and not tender, whereas a furuncle is not movable and very tender. Granulations are not painful and give a history of a long duration, whereas a furuncle is an acute process. Perichondritis is a diffuse process which may involve the entire auricle, whereas a furuncle is a circumscript process found in the canal proper and does not spread to the auricle. Carious teeth are readily differentiated by the absence of any aural tumefaction and the presence of tender, infected teeth. Parotid abscess shows a tender swelling over the parotid gland and pressure over this swelling may cause the discharge of pus through the fissures of Santorini into the external auditory canal.

The differential diagnosis of furunculosis of the external auditory canal from acute mastoiditis is detailed in the following table:

Furunculosis	*Mastoiditis*
HISTORY	
1. Former attacks common.	1. Former attacks unusual.
2. History of mechanical irritation.	2. No mechanical irritation.
3. Onset rapid.	3. Onset gradual.
4. Height of disease at the third day.	4. Disease begins usually three weeks after an acute purulent otitis media.
5. May or may not be associated with an acute purulent otitis media.	5. Usually associated with an acute purulent otitis media.
SUBJECTIVE SYMPTOMS	
1. Pain is greater than in mastoiditis.	1. Pain is less than in furunculosis.
2. Tender spots in canal.	2. No tender spots in canal.
3. More crying on the insertion of the speculum due to passage over furuncle.	3. No crying on the insertion of speculum, except from fear.
4. Pain on irrigation.	4. No pain on irrigation.
5. Pain over parotid (in furuncles of anterior wall).	5. No pain over the parotid.
6. Pain on mastication (pathognomonic sign).	6. No pain on mastication.
7. Hearing normal or diminished, according to size of the furuncle.	7. Marked deafness.
OBJECTIVE SYMPTOMS	
1. Canal narrow at the orifice.	1. Canal narrow at the fundus.
2. Tumefaction in the external fibrocartilaginous canal.	2. Tumefaction in the internal osseous canal.
3. One or more tumefactions (furuncles have a tendency to appear in crops)	3. One tumefaction.
4. Tumefaction on the posterior inferior wall or on the anterior wall.	4. Tumefaction on the posterior superior wall.
5. Auricle sensitive to touch.	5. Auricle not sensitive to touch.
6. Auricle displaced forward.	6. Auricle displaced forward and downward.
7. Skin tense over mastoid.	7. Skin freely movable.
8. Edema over the mastoid, but no bone tenderness. (Tenderness is usually obtained but this is not bone tenderness. It is due to the skin being moved and traction made on the tender auricle. This traction can be avoided by exerting firm pressure inwards, avoiding stretching the skin away from the ear.)	8. Edema and bone tenderness.
9. Tympanic membrane not perforated.	9. Tympanic membrane perforated and discharging.
10. Tympanic membrane may be normal or slightly congested.	10. Tympanic membrane shows the signs of an acute purulent otitis media.

In spite of all the above detailed signs, there are cases when the diagnosis cannot be definitely made and the patient has to be kept under observation for a few days. In children, the subjective symptoms are unreliable and should be disregarded and the diagnosis made on the physical findings. The cases reported are typical and they accentuate the great difficulties encountered in making this differential diagnosis, and at the same time show how the diagnosis was made.

CASE I.—Agnes S., nine months old, was restless and fretful for three days and did not sleep well at night. She kept continually pulling at her right ear and tossing from side to side. She refused to nurse. The temperature was 99.6° by rectum. She was referred for paracentesis with the diagnosis of acute otitis media with mastoid involvement.

Examination of the ear was very difficult, because of the continued crying and struggling, and it was evident to all present that the crying was louder when the auricle was touched, and especially when the speculum was introduced. Tenderness over the mastoid could not be definitely ascertained, because the child kept crying no matter what part of the head was touched. On drawing the ear downward and backward a fair view of the meatus was obtained, showing a red tumefaction in the canal. The tympanic membrane could not be seen and this tumefaction had been mistaken for a congested drum, but it was entirely too far forward to be the tympanic membrane. Furthermore, a probe could be passed between the swelling and the anterior wall, thus definitely localizing the inflammation as starting from the posterior wall. The swelling was incised and a small amount of pus was obtained. The child's symptoms did not seem to abate for she was restless the whole night, but on reexamination the next day the speculum could be pushed past the furuncle and a normal intact drum was seen. The symptoms gradually subsided, and at the end of a week the meatus presented a normal appearance.

CASE II.—Mary P., three years old, had a running ear for about a year and a half, which gave her no trouble, except for the discharge. For about a week the child had been picking at her ear and for the last two days complained of pain. This pain had become so severe that the ear could not be irrigated without throwing the child into a fit of agony. The mother stated that the discharge had been growing less and less during the whole week.

Examination showed a bulging ear, standing away from the head, a swelling and tenderness over the mastoid, and a temperature of 100°. Considering the old middle ear suppuration, the sudden diminution of the discharge, the mastoid swelling and tenderness, the pain, the sleeplessness, the rise in temperature and the displacement of the ear, the first consideration was acute mastoiditis. On careful examination it was observed that the displacement of the auricle was forward, and not forward and downward, and that if pressure on the mastoid was firmly but carefully made, using the thumb and pressing inward, avoiding traction on the auricle there was no pain. The orifice was narrowed and showed a diffuse swelling of the posterior wall, which was large enough to dam back any discharge from above. Pushing the speculum past this furuncle caused a great deal of pain, but the drum could be seen with a profuse discharge coming from it. The furuncle was incised and the child made an uneventful recovery.

Case III.—Sam K., three and a half years old, was brought to the clinic with a diagnosis of acute mastoiditis. The history showed that he had had an attack of pain in the ear four days ago, which still persisted, only being intensified, in spite of the fact that the "ear had been opened," using the mother's words, on the first night of his attack. No discharge had been obtained and the mastoid became very tender, the child cried and was sleepless. The doctor who had treated the child advised the mother to take him to the hospital as he had mastoiditis.

Examination showed no displacement of the ear, but revealed edema over the mastoid region. Tenderness was acute and because of the child's struggling it could not be determined whether this was deep or superficial. There was no discharge, but the drum was congested, although the landmarks could be distinguished. There was a swelling of the posterior wall down deep in the canal which gave an appearance of the sagging in mastoiditis. However, it seemed that the swelling was not far enough down to be in the osseous portion. The canal was unusually short and narrow and the locality could not be positively diagnosed. Upon touching the auricle the child cried, but he was a very bad patient and too much trust could not be put in this sign. A tentative diagnosis of acute mastoiditis was about to be made when the mother volunteered the information that the child had told her it hurt him to chew. Pain upon mastication I consider a pathognomonic sign of furunculosis, and having obtained this information I incised the swelling and pus was evacuated. The relief that night was marked and the child slept well. The next day he was playful and more cooperative. The drum still showed a little congestion. Gradually the supramastoid edema and tenderness disappeared and the recovery was complete. At no time was there any discharge from the middle ear.

Case IV.—Harry G., twenty-three months old, was reported by the ward nurse as sick. For two nights he did not sleep well, and the last night he cried so much that the other children were disturbed. Physical examination was negative. The report of the routine ear examination was tenderness and swelling of the mastoid, with the diagnosis of acute otitis media with probable involvement of the mastoid.

My examination corroborated the swelling and tenderness over the mastoid, but upon waiting until the child was quiet and then making careful pressure inward, avoiding traction on the sensitive auricle, the child would not cry. The ear showed a narrow lumen at the orifice, a tumefaction on the posterior wall, somewhat inferiorly, a slightly congested tympanic membrane and a forward displacement of the auricle. The diagnosis was changed to furuncle of the posterior inferior wall. The abscess was incised, and the child slept well for three nights. At the end of this time he was again reported ill, with a similar history of crying and sleeplessness. In addition the nurse stated that she had observed the child pulling at the ear. Examination at this time showed that the swelling and tenderness over the mastoid had subsided, the auricle had returned to its normal position, the tympanic membrane was normal, but there was a newly formed furuncle on the anterior wall opposite the former one. This was incised, and the child was referred to the pediatrist for the improvement of his general nutrition.

Case V.—Milton C., three years old, gave a history of frequent attacks of acute tonsillitis, mouth breathing, nasal obstruction and occasional pains in the ears for a period of about two years. The tonsils and adenoids had been removed a year before following an attack of acute purulent otitis media. He had been in comparatively good health from that time until four days before, when he began putting his finger in his ear, but refused to admit the presence of any aural pain. During the night he awoke several times, put his hand to his ear, but when interrogated refused to admit any pain. The mother stated that she believed that denial of pain was due to the fear of being taken to the doctor. In the morning the child was peevish, cranky and restless, but still denied aural pain. The mother called in her family physician, who found a congested drum and performed a paracentesis. The child felt worse that night and showed no improvement the next day.

Examination of the orifice as well as irrigation showed no discharge. The mother, who was an intelligent woman and had had a great deal of experience with the care of the ear during the child's previous illness, as well as in the ear troubles of her other children, tested for tenderness over the mastoid and discovered acute pain. She reported this to her physician who referred the case.

Examination showed tenderness over the mastoid region, but because of the child's conflicting and untruthful replies and maneuvres it could not definitely be distinguished whether it was skin or bone sensitiveness. The auricle was very tender to the touch. The canal showed a slight tumefaction, red in color, on the posterior wall. The tympanic membrane was slightly congested, the landmarks were easily distinguished, and the incision made was of good size, but there was no discharge. The child was placed on hot alkaline irrigations and observed daily. In two days the tumefaction was definitely visible and distinguishable as a furuncle of the fibrocartilaginous wall. It was incised and the child made an uneventful recovery.

Case VI.—Bertha L., four years old, a mentally defective child in my service at Randall's Island, was presented with the diagnosis of acute otitis media and mastoiditis. The child was a helpless, low grade idiot, who could not talk, walk or even stand, and the subjective signs were therefore unreliable.

The ear showed a marked edema over the mastoid region. Pressure did not elicit any marked reaction. The child simply moved her head away, but this did not eliminate the presence of tenderness for in the low grade defective there is a diminution in the perception of the tactile and pain senses. The auricle was displaced forward and downward, but comparison with the other side showed a similar deformity, both ears being large and batlike, and this displacement was therefore considered one of the stigmata of degeneration. The lumen of the canal was very narrow and entirely obstructed by a diffuse swelling in the fibrocartilaginous portion. It was impossible to see the drum. The obstructing swelling was incised freely and pus was evacuated. A cotton tipped probe could then be passed between the swelling and the anterior wall, demonstrating that the tumefaction was from the posterior wall. The following day a small Boucheron speculum could be pushed past the furuncle and an intact drum was seen. The postauricular edema gradually subsided and the child made an uneventful recovery.

CASE VII.—Ellen L., three years old, had a suppurating ear for nine weeks. A week before I saw her she began complaining of pain and itching in the ear. The pain was aggravated by the irrigations. The auricle had been gradually pushed forward and a tender swelling had developed behind it. The child could not sleep, would not eat, and was very irritable. The temperature was 100.8° by rectum. Because of the pain during the irrigations, the mother discontinued them. Hearing on the affected side was impaired to such a marked degree that if the mother happened to call the chlid on that side there was no response. The history of the existence of a running ear for nine weeks with the sudden development of temperature, pain, and a tender swelling over the mastoid region warranted the diagnosis of a suspected acute mastoiditis.

Examination, however, showed that if the pressure over the mastoid was directed inward, avoiding traction on the concha, there was no tenderness, that the skin was tightly adherent, that the auricle itself was very sensitive, that there was an eczema at the meatus, and that there was a furuncle of the fibrocartilaginous canal with an impacted thick purulent secretion about it and behind it. The furuncle was incised and by suction the impacted pus was evacuated. The ear was placed on daily suction treatments, and a bland ointment was prescribed for the eczema. At the end of two weeks the entire discharge cleared up.

CASE VIII.—Annie S., four and a half years old, was sick for eight days, suffering from a small tender swelling in front of the left ear, and a purulent discharge from the ear. At the beginning of the disease there had been pain on mastication, which subsided soon after the onset of the discharge. Two days before I saw her, she manifested an attack of severe pain in the ear, and the discharge gradually diminished until it stopped completely. The temperature rose to 101° by rectum. The ear was displaced forward and there was a tender swelling over the mastoid region. The day before I saw her a paracentesis was done with no relief of the symptoms.

Upon examination I found a small furuncle on the anterior wall, which probably had caused the first symptoms, i. e., pain and swelling of the parotid gland. In addition, there was an angry red furuncle obstructing the lumen at the lower end of the posterior wall of the fibrocartilaginous canal. The drum was lacerated and covered by a purulent discharge, but whether this came from the middle ear or was dammed back from the old furuncle by the new furuncle could not be definitely determined. The ear was cleansed carefully, suction being used, and the new furuncle was incised. At the end of a week the postauricular tenderness and swelling subsided and the discharge cleared up, demonstrating that there had never been any involvement of the middle ear and that the purulent secretion that covered the tympanic membrane came from the furuncle.

CASE IX.—Fannie L., four years old, was restless, peevish and feverish for nine days. She kept continually pulling at her left ear and complained of severe aural pain. The temperature was 100° by rectum. The history showed previous attacks of acute otitis media. The tonsils and adenoids were removed a year ago.

Examination of the ear showed a forward displacement of the auricle, supramastoid edema and tenderness, and a moderate degree of tenderness of the auricle. The posterior half of the tympanic membrane was congested, and there was a red swelling on the posterior portion of the canal. The case had been diagnosed as acute mastoiditis. Careful inspection, however, revealed that the swelling of the canal was rather inferiorly situated and that the congestion of the drum was a diffuse extension process from the swelling. The tenderness over the mastoid region was markedly lessened when the pressure was exerted inward avoiding traction on the auricle. A diagnosis of furunculosis was made and the suspected furuncle was incised. No pus was evacuated, but by the following day the subjective symptoms had abated, the supramastoid edema was lessened, the tenderness was diminshed, the temperature was down to normal, the tympanic membrane congestion was about gone, and there was a free discharge from the furuncle. The close simulation of the furuncle to acute mastoiditis in this case was due to the deepseated locality with the consequent long duration of coming to the surface.

CASE X.—Thomas C., fourteen months old, was referred with a tentative diagnosis of acute otitis media and mastoiditis. The mother stated that for about four days the child's general behavior had been showing a distinct change. He refused his food, was cranky and irritable, and for the last two days cried without apparent provocation, especially during the night. The day before, the mother noticed a marked swelling behind the left ear, which was tender to the touch. She became alarmed and took the boy to her family physician, who warned her of a possible impending mastoiditis and advised surgical intervention.

Examination showed a tender swelling over the mastoid region (which tenderness, however, was not obtained upon careful inward pressure), a forward displacement of the ear, a tender auricle, and a temperature of 100.8° by rectum. The tympanic membrane could not be seen because of the extremely narrow lumen, but a swelling of the posterior portion of the canal was distinguishable. Comparison with the other side showed a lumen of normal width in the unaffected ear. The absence of real bone tenderness over the mastoid, the absence of a discharge, the absence of a downward as well as a forward displacement of the auricle, pointed against mastoiditis while the presence of the orificial narrowing of the lumen as compared with the healthy side, the shortness of the duration of the disease and the presence of the tumefaction on the canal wall, (in spite of the fact that I could not inspect the tympanic membrane) made me incline toward regarding the tumefaction as a furuncle. Upon this assumption I incised the swelling and evacuated pus. The following day the width of the lumen was increased, demonstrating that the narrowness was due to an inflammatory diffusion from the furuncle. The tympanic membrane was visible and normal in appearance. Gradually all the symptoms abated and at the end of ten days the child was discharged as cured.

In concluding, I wish to draw attention to the fact that the symptoms that simulated mastoiditis were the external ones, the displacement of the ear, and the supramastoid tenderness and swelling. In addition, in those cases where there had been previously a running ear, the cessation of the discharge and the rise in temperature enhanced the suspicion. However, in almost every case the otoscopic picture revealed the presence of the real condition—furunculosis. Painstaking examination usually eliminates the other conditions, but as shown there are cases where even the most careful examination leaves one baffled and then the only test is the test of time, the ear being carefully observed from day to day until the furuncle matures.

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231 East Eleventh Street.

Acute Mastoiditis*

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One of the commonest diseases which the physician is called upon to treat during the early spring months is suppurative otitis media. Most cases of this disease are for various reasons treated by the general practitioner. In some cases the otologist is called on to open the drum. Sometimes the doctor in charge opens it himself, and in others the drum has already ruptured before the physician has seen the patient, but once the discharge has commenced very often the observation of the progress of the disease toward resolution or otherwise is in the hands of the general practitioner.

The question which in each case presents itself is, Will this particular patient's ear inflammation resolve or will it go on to mastoiditis? In most instances we are at a loss to answer and it would seem wisest, at the risk of being considered alarmists at times, to use, from the very outset, every possible precaution to obviate the latter development. When to open the drum, whether to open it early or to wait in the hope that the inflammatory secretion will be absorbed or drain through the eustachian tube, is a question that has been widely discussed. The pendulum has swung both ways. It would seem that the best indication is to observe closely the amount of bulging present, and not open the drum for redness without bulging.

The operation of myringotomy is with ordinary care devoid of danger. It should not be a stab wound, but an incision through about a quarter of the drum's periphery. The posterior inferior quadrant is generally the site for this incision. The cut is oftenest made from below upward, but where the bulging is most prominent in the upper half of the drum it might be better to begin in this region and incise from above downward. A danger which is present when this little operation is done roughly, is the dislocation of the stapes from the oval window with a subsequent invasion of the labyrinth followed by meningitis. This has happened.

It is probable that in every case of suppurative otitis media there is some degree, however slight, of inflammation in the mastoid with pus in variable quantity. The direct communication which exists between the middle ear and the mastoid cells would seem to preclude the possibility of the limitation of the involvement to the tympanum. One, too, has but to consider the quantity of discharge which pours out in a moderately severe otitis media, remembering as well the smallness of the middle ear cavity, to realize that this secretion could not all be contained in that minute space. Up to a certain point this inflammation by continuity is only of scientific interest, and that is when the mastoid cells become so involved in the process that they are more or less filled with the products of inflammation, and necrosis attacks the delicate septa which are the boundaries of the cells. When this stage is reached we have what is known as an operative mastoiditis.

One of the most difficult problems which the otologist has to solve is this question. When is a given case, which has been under observation as one of mastoid involvement, no longer to be treated palliatively and surgical intervention indicated? Nature has a way of surprising us occasionally and cases which are quite apparently hopelessly operative, will resolve without surgical intervention. It is not safe, however, to trust too much to fortune, and remember that it is the patient who is carrying the risk. What can happen, we are often asked, if such a patient is not operated upon? Complete recovery, possibly but not probably, recovery with some impairment of hearing, partial recovery with a chronic purulent otitis media, or complications such as invasion of the blood stream or meninges.

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There are certain salient points in the diagnosis of an operative mastoiditis on which all otologists are fairly well agreed. Few cases have all the classical or typical signs and symptoms and often the diagnosis is based upon one or two outstanding points.

MASTOID TENDERNESS.

If one can demonstrate this sign clearly, and if it is persistent for let us say five or seven days after the drum has been opened, or is increasing in its area, the value of this sign is very great. Its absence, however, does not mean much as a fair proportion of badly broken down mastoids have no tenderness whatever, due sometimes to a thickened cortex. Then again it is not easy to elicit this sign in a struggling crying child, and a good many of our cases seem to be in children. Tenderness can be evoked on pressure over the antrum in many cases of acute otitis before the drum has been opened, after which in favorable cases it speedily disappears.

AURAL DISCHARGE.

When a middle ear abscess first commences to discharge generally the quantity is quite profuse and this is expected. It is then straw colored, or mucopurulent. In the second week the quantity, if the case is going to resolve, should diminish. If, however, the discharge is still profuse through the second or third week, it is strongly suggestive of an involved mastoid. The only way to judge this accurately is to put the patient in a good light, carefully cleanse the canal of all secretion and then wait for a few minutes to see how soon the discharge reappears through the drum opening. The manner in which this discharge wells out at times, is, when one considers the smallness of the middle ear cavity, positive evidence of a suppurative mastoiditis.

FEVER.

In purulent otitis media before the drum is opened a temperature, up to 105° in children, is fairly common, and one is not surprised when some amount of fever persists for say five or seven days. However, if the temperature continues elevated it is a symptom which should be considered. One often sees a case which has no very outstanding acute symptoms but which has run along for two or three weeks with a fairly constant evening temperature around 101°. That is almost invariably an operative mastoid. Fever is almost always absent in an adult, but the absence of fever does not negative the diagnosis of mastoiditis, as one often sees on operation a badly necrotic mastoid in a patient who has been afebrile throughout.

PAIN AND INSOMNIA.

When a middle ear is draining freely there should be no pain, it is the retention of discharge which gives this symptom, and if the drum opening is patent, of course this pent up secretion is in the mastoid cells. Like bone pain of other varieties this is worse at night and disturbed sleep is a fairly constant symptom of mastoid disease. Actual pain may not be present, there may be instead a feeling of fulness, of discomfort, of distinct difference between the diseased and the normal side. Neuralgic pains are sometimes noticed. On the other hand, there are many cases in which these symptoms are not noticeable.

CHANGES IN THE DRUM AND DROOPING OF THE POSTEROSUPERIOR CANAL WALL.

It is by examination of the drum and the canal wall that one can tell best the amount of trouble present. There may be an absence of pain, tenderness, and fever, but in all cases of operative mastoiditis these drum changes and generally a profuse discharge are present. The drum membrane is thickened, reddened and markedly bulging in the posterosuperior quadrant. There is a thickening of the canal wall in that spot caused by periostitis, and a consequent drooping and blending together of the canal wall and the upper part of the drum membrane, with a loss of the usual demarcation between the two. These changes are best brought out by comparison of the two sides, the narrowing of the inner end of the auditory canal on the diseased side showing plainly in contrast with the normal ear.

SUMMARY.

The clinical picture to be looked for is made up of mastoid tenderness, profuse aural discharge, fever, pain and insomnia, and a drooping of the posterosuperior canal wall. The difficulty one meets is the absence of one, two or three of these symptoms. There are, it seems to me, a fairly large proportion of cases of operative mastoiditis with but two of these essentials, the changed drum and the profuse aural discharge, and it is in these cases that the patients are sometimes reluctant to be operated upon, a fact easily understood, free as they are from the driving urge of pain and fever. It is here that the x ray is sometimes of value when it can demonstrate the breaking down of the intercellular septa. Marked and progressive diminution of hearing of the conducting mechanism type may be considered as evidence of a nonresolving mastoiditis. A coated tongue and the sallow complexion which goes with septic absorption are also signs which should urge us to operative intervention.

Occasionally in the adult and comparatively often in children we have seen pus from the suppurating mastoid break through the cortex and form beneath the periosteum what is called a subperiosteal abscess. This is generally above the auricle which is pushed downward and forward. Or there may be postauricular edema from the inflammation of the underlying bone. Then there is a variety of swelling under the fascia of the temporal muscle where the pus follows the oval outline of the muscle. Occasionally we have a swelling in front of and above the auricle where the pus breaks through the zygoma. Sometimes the inner surface of the tip of the mastoid process is eroded through and an abscess is formed beneath the sternocleidomastoid muscle, called a Bezold abscess. Of course these various swellings are positive indications for the mastoid operation.

Of late years the postoperative period has been shortened and the dressings have been made much less painful by the use of a smaller amount of drainage in the mastoid wound. Three weeks is a fair average of the length of the postoperative period with this method of dressing. There is much less pain in changing the dressing when the drain is less than a foot in length than in the method where the packing was inserted by the yard. There is another distinct benefit too, in the absence of deformity, as with this new way of dressing the wound there is left no depression over the mastoid area, the only remainder of the operation being the scar of the incision.

The complications of mastoiditis are in the order of their occurrence, erysipelas, infection of the lateral sinus, meningitis and cerebral abscess.

After a mastoid operation, like any other operation on the head, there seems to be a special tendency to the development of erysipelas. This is rarely fatal and seldom serious except in the very young or the aged. The temperature range is of the septic variety, has wide variations, and sometimes is observed for a few days before the appearance of the eruption. Of course one is then at a loss to account for the fever until the characteristic erythema is seen. I have had some help in the treatment of this complication from intramuscular injections of phenoiodine. I remember particularly two cases in which this was used with great benefit. In one case the patient was five months old in whom erysipelas developed after a double mastoid operation, and in the other the patient was an old lady in the sixties who had a similar complication after mastoidectomy.

Infection of the lateral sinus is a fairly common complication of mastoiditis. I think that in about two per cent. of my operated mastoid cases this complication appeared.

The typical picture is shown pathologically by a thrombus in the sigmoid sinus which contains the same organism as that in the aural discharge, this clot throwing off toxins into the general circulation periodically every twenty-four or forty-eight hours, these toxins being absorbed or becoming the starting point of a metastasis. The liberation of these poisonous products is marked by the symptoms of sepsis with a sharp chill, a sudden rise of temperature up to say 105°, followed by a remission and sweating.

The clot may be enormous in size. In one of my cases it extended to the torcular and I was unable to get free bleeding posteriorly. At times no clot is demonstrable and hemorrhage is met with immediately on slitting the sinus. In these cases no doubt at times a mural clot is present which is washed away by the gush of blood. However, in other instances where no clot is seen, the condition is doubtless phlebitis or septicemia. A marked leucocytosis and a high polymorphonuclear percentage are invariably present, and the invading organism is nearly always to be found on blood culture. The treatment of this condition is either ligation or resection of the internal jugular vein with removal of as much of the septic clot from the sinus as possible.

A typical example of infection of the lateral sinus was seen in my practice a few weeks ago, and as it illustrates the disease so thoroughly, a brief history of the case may not be remiss.

Case.—W. V. K., two years of age, a patient of Dr. Talmage, was operated upon on January 25, 1922, at the Bronx Eye and Ear Infirmary, a mastoidectomy being performed on the right side, after an acute middle ear infection which had lasted seven days, during which time, in spite of free drainage the temperature range each day had reached about 105°. The patient did well until the fifth day, when the temperature rose from 100° to 104°. From that time he had seven of these elevations of temperature on successive days, as seen by the accompanying chart. During this period he was being watched carefully, of course, and nothing was found amiss except some adenitis on the other side of his neck. After his fourth rise of temperature a blood culture was taken, which was reported positive for the pneumococcus after forty-eight hours' incubation. A blood count showed a white count of 21,000 and polymorphonuclears eighty-nine per cent. Dr. W. C. McFarland saw him then in consultation and we agreed that in view of the septic temperature, positive blood culture, and leucocytosis, a diagnosis of infection of the lateral sinus was justifiable. The next morning I resected the internal jugular vein from a point above the clavicle to just above the facial vein, and then opened the sigmoid sinus. No clot was seen. He had one postoperative rise of temperature to 104°, after which the fever kept permanently below 101° and gradually receded to normal. The neck wound drained profusely for about ten days. At the time this report was presented it

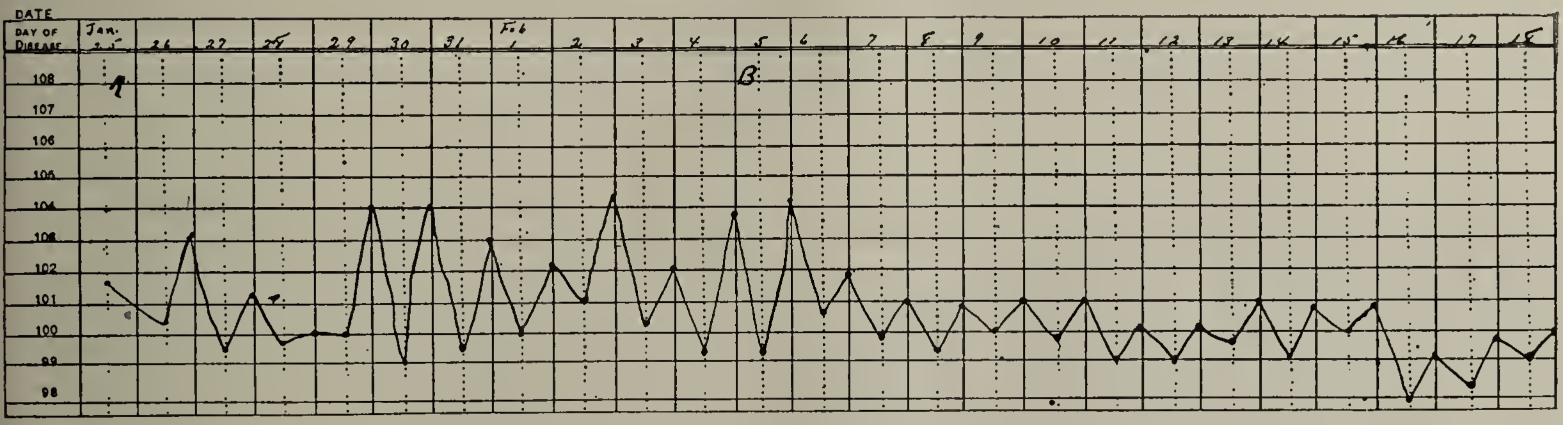

Chart.—Temperature chart in a case of infection of the lateral sinus.

had quite healed, and the mastoid wound was still discharging. Physically he was in good condition.

The most dreaded complication which we meet is meningitis. Kerrison classifies the different varieties as circumscribed pachymeningitis, diffuse purulent leptomeningitis, circumscribed leptomeningitis, and serous meningitis. Lumbar puncture furnishes us with the most reliable data as to the nature and gravity of the lesion. I have known of a few cases in which the meninges were involved apparently coincidently with the onset of the ear inflammation and in spite of early mastoid operation went rapidly on to a fatal outcome. Brain abscess is so rare that we need but mention it here.

In conclusion, I wish to say that I know one is prone to exaggerate the importance of his own subject, and I have tried to steer clear of this pitfall in presenting my problem. I think all of us should consider each case of purulent otitis as a potentia mastoiditis and treat it seriously from the outset. In that way possibly more patients can be saved from an operation which though comparatively safe is attended by much discomfort. We should study the various signs and symptoms mentioned above in connection with each case and ascertain under what category it falls. This is not a plea for early mastoid operation but rather an appeal to our discrimination and judgment in deciding when such intervention is inevitable.

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An Analysis of the End Results of Tonsillectomy and Adenoidectomy

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This statistical report of one hundred cases of tonsillectomies and adenoidectomies is presented to show, if possible, a basis for indications for the removal of hypertrophied and diseased tonsils and adenoids. Whether these lymphoid structures have functions other than acting as a barrier to infectious diseases, is a moot question, but it is highly probable, judging from clinical experience, that their removal does not produce any pathological or functional defect nor expose the organism to increased risks. However, the question remains whether removal of tonsils and adenoids eliminates the cause for which operation is performed. The analysis of our cases is an attempt to place this problem on a firmer basis.

We were led to this question because of the many conflicting statements regarding the effect of the removal of these organs and furthermore because of the belief of many mothers that ailments of varied nature would be cured by this operation and their insistent requests for operation. To meet this problem as scientifically as possible, we decided to analyze at least a hundred cases of removal of more than a year's standing, entering into a careful preoperative and postoperative history, careful physical examination and collecting all other data that might be of value in coming to a tentative conclusion.

Our material came from the Lebanon Hospital Dispensary and the patients were operated on either in our dispensary, in other institutions or at home. Because of the various methods of operation, we soon found that it would be advisable to divide our cases into two general groups, namely tonsillectomies and tonsillotomies, and consider the various causes for removal under these heads. We also considered the effect of operation on glandular enlargement so common among children: diseases contracted since removal; diagnosis at time of examination and the general condition at time of examination.

Causes for removal.—Frequent colds, fifty-five; mouth breathing, forty-four; malnutrition and anemia, sixteen; tonsillitis, eighteen; otitis media, nine; asthma, four; cardiac lesions, four; advice of school nurse, seven; stunted growth, diphtheria and chorea, one each.

A careful perusal of Table I shows the usual causes for which tonsillectomy and adenoidectomy are advised: the effect of the operation, at least a year later and the general condition of the patient during the period of observation. The conclusions drawn from an interpretation of these figures show that tonsillectomy and adenoidectomy are beneficial to a certain extent, but not as much so as has been asserted. It shows that many children are unnecessarily operated upon; that only in selected cases will benefit be derived, and that mothers, as a result of persistent propaganda, are seeking operation for the relief of many conditions, only to be disappointed later. Inasmuch as it does good in a certain number of cases, the problem is to discover these indications.

The most frequent cause for which operation is sought is socalled colds. By these colds we mean nasopharyngitis with or without tonsillar (nonexudative) involvement. In the hundred cases, fifty-five patients were operated upon for frequent colds. In a way it is unfortunate that not all operators performed the same operation for, as a result, we find that in thirty-six cases tonsillectomies were performed and in nineteen tonsillotomies. Our analysis of the cases shows that of the total number operated upon, forty-nine per cent. showed improvement and fifty-one per cent. no improvement, some of the conditions even growing worse following operation.

f these cases are separated according to the ype of operation performed, we find that the tonsillectomies show fifty-eight per cent. improvement, while the tonsillotomies only thirty-two per cent. Before interpreting these figures, we must allow for a certain number of patients, who would have immunized themselves and would have shown improvement even without operation. It is a common observation that certain children will suffer from these colds for a year or more, and suddenly, for no apparent reason, except that they have become immunized as a result of previous infections, have few if any colds the following year. So in analyzing these figures it is well to remember that probably, among the cases reported improved, a certain percentage of the patients showed improvement as a result of this selfimmunity and these benefits should not therefore be ascribed to the operation; in other words, we believe that this operation will show results at best in only half the cases, and then only if a tonsillectomy is performed.

TABLE I.

Cause of Operation	No.	Tonsillectomies				Tonsillotomies				Effect of operation on cause		
		No. of cases	Improved	Not improved	Worse	No. of cases	Improved	Not improved	Worse	Improved	Not improved	Worse
Frequent colds	55	36—62½%	21—58%	15—42%	none	19—34½%	6—32%	9—47%	4—21%	27—49%	24—43½%	4—7½%
Mouth breathing ..	44	28—66%	18—64%	10—36%	none	16—24%	4—25%	8—50%	4—25%	22—50%	18—41%	4—9%
Malnutrition and anemia.	16	13—81%	10—77%	3—23%	none	3—19%	none	2—67%	1—33%	10—62½%	5—31%	1—6½%
Tonsillitis... (rheumatic 6)	18	18—100%	15—83%	3—17%	none	none	none	none	none	15—83%	3—17%	none
Otitis media.	9	8—89%	5—62½%	3—37½%	none	1—11%	1—100%	none	none	6—66%	3—34%	none
Asthma	4	3—75%	none	3—75%	none	1—25%	none	none	1—100%	none	3—75%	1—25%
Cardiac lesions	4	3—75%	1—33%	2—67%	none	1—25%	none	none	1—100%	1—25%	3—75%	none
Advice of nurse...	7	5—71%	2—40%	2—40%	1—20%	2—29%	1—50%	none	1—50%	3—43%	1—14%	3—43%
Stunted growth.....	1											
Diphtheria..	1	3—100%	2—67%	1—33%	none	none	none	none	none	2—67%	1—33%	none
Chorea......	1											

TABLE II.

Cause of operation		Glands palpable at least one year after operation				General Condition at time of examination		
		Location of glands		Nature of operation		Good	Fair	Poor
Frequent colds	38	anterior cervical submaxillary	24 14	tonsillectomy tonsillotomy	14 24	27—49%	12—22%	16—29%
Mouth breathing	31	anterior cervical submaxillary	20 11	tonsillectomy tonsillotomy	13 18	16—36%	13—30%	15—34%
Malnutrition and anemia	4	anterior cervical submaxillary	3 1	tonsillectomy tonsillotomy	2 2	4—25%	6—37½%	6—37½%
Tonsillitis	6	anterior cervical submaxillary	3 3	tonsillectomy	6	8—42%	5—29%	5—29%
Otitis media	4	anterior cervical submaxillary	2 2	tonsillectomy	4	7—78%	1—11%	1—11%
Asthma	2	anterior cervical submaxillary	1 1	tonsillectomy	2	2—50%	1—25%	1—25%
Cardiac lesions	2	anterior cervical	2	tonsillectomy tonsillotomy	1 1	1—25%	3—75%	none
Advice of nurse	4	anterior cervical submaxillary	3 1	tonsillectomy tonsillotomy	3 1	3—43%	2—28½%	2—28½%
Heterogeneous group	1	anterior cervical	1	tonsillectomy	1	1—33%	2—67%	none

Mouth breathing ranks second as a cause for which this operation is performed. This complaint is usually associated with that of colds, so that the mother's hope is often to relieve both conditions by a single sweep of the knife. With mouth breathing we usually find the symptoms of dryness and parching of the mouth, tongue and lips, snoring at night, restless sleep and other disturbances. Our statistics show, however, that only about a third of the patients were relieved of either the primary or secondary symptoms, which makes it evident that mouth breathing *per se* is not a definite indication for the performance of this operation, and therefore no operation should be performed unless it can be shown that the adenoids, and not an intranasal obstruction, are the cause of the symptoms.

In the malnutrition and anemia series of sixteen cases, the mothers' histories show improvement in ten of the cases following operation. We feel that a better way of judging is not by the word of the mother, but by our own observations of the child. Our figures in Table II show that in only four of the total of sixteen cases grouped under this head, were the patients in what we would call good general condition. Here again it must be evident that operation for this cause must not be advantageous, and if we consider that possibly there may be other conditions beside the operation that have entered into the improvement of these four patients, it is evident that we should hesitate to remove tonsils and adenoids with any promise of improvement in malnutrition and anemia.

Tonsillitis must be separated clinically from nasopharyngitis (socalled colds). It is not infrequent for patients suffering from nasopharyngitis to have an accompanying congestive (nonexudative) tonsillitis. Clinically tonsillitis with follicular exudate seldom involves the mucous membrane of the nasopharynx and is a distinct clinical entity. In this type of tonsillitis, which unfortunately is often rheumatic, we find our best results from operative procedure. It must be understood that the favorable results obtained through this operation in pure tonsillitis is referable only to the tonsillitis itself and not to the general rheumatic tendency, of which the tonsillitis may be only a local manifestation. But as tonsillitis and rheumatic manifestations frequently accompany each other, it is well to look upon the tonsils as the focus of infection, and feel that the removal of the tonsils may at the same time remove the rheumatic tendency. In our series of eighteen cases of pure tonsillitis, six patients, or thirty-three and a third per cent., gave a history of rheumatic symptoms, and eighty-three per cent. manifested no further tonsillar attacks, thus showing, as far as one can by statistics, that tonsillitis is an indication for a complete enucleation operation, with the hope that the secondary rheumatic tendency that usually accompanies this condition may possibly be removed at the same time.

In our nine cases of chronic otitis media, we found that the removal of the tonsils and adenoids was distinctly indicated. In four of these cases, where observation had lasted over a year, all available treatment had failed to cause a cessation of the discharge. Tonsillectomy and adenoidectomy were performed as a last recourse. In three cases there was an immediate cessation of the discharge within a week, and in the fourth, a marked improvement. In the total series of nine cases, six were cured and three unaffected; indicating that in the majority of instances the tonsils and adenoids were a source of irritation and that their removal tended to clear up the discharge. Indication for operation for all chronic ear discharges is evident.

Digital examination of the nasopharynx revealed the presence of adenoid tissue in five of these cases, the three unimproved cases being among this group. We were unable to induce the mothers of the three otitic children in whom the discharge persisted to consent to the removal of the remaining adenoid tissue.

Four children had definite cardiac lesions existing previous to operation for a period of from six months to three years. In this group of cases the idea was not that of possibly eradicating the cardiac lesion, but rather of preventing any further damage to the heart, for in the presence of a cardiac lesion the tonsils are usually a focus of infection. That this is true in part is well shown in one of our cases. This child, previous to operation, complained of an almost continual pain in the precordium, palpitation and dyspnea upon exertion. Two months after operation, a tonsillectomy having been performed, the child was up and about, a regular attendant at school and had entirely forgotten about her previous state of ill health. Judging by the general condition of these children at time of examination, one being in good condition and the other three in a fair state of health, we believe that the presence of a cardiac lesion in a child should be an indication for tonsillectomy and adenoidectomy so as to prevent, if possible, any further damage to the heart.

Under the head of miscellaneous we have grouped the remaining indications for operation in our collected cases. These consisted of four cases of asthma: seven cases advised by the school nurse to have the operation performed; and a heterogeneous group, in which the causes were varied, such as stunted growth, chorea, and recurrent attacks of diphtheria.

Improvement was not seen in any of the asthmatic cases following operation. The general condition was good in two cases, fair in one and poor in one. If we were to judge from this, we would hardly place asthma as an indication for tonsillar removal. We believe, however, that the number of cases is entirely too small to reach a definite conclusion.

In the seven children operated upon on the advice of the school nurse, we have a group of chlidren who, previous to operation, were in the best of health. The only indication for the performance of the operation was the presence of tonsils that were visible to the naked eye. The only question to be considered here in reality is the effect of tonsillar removal upon healthy children. From our few cases, the indication would seem to be that tonsillar removal in healthy children does harm, for fifty-seven per cent. of these children were in a poorer state of health after operation. We cannot state that the changed general condition was directly due to the tonsillar removal, for we do not think we have had a sufficiently large number of cases to judge. What does seem evident is that there was no definite benefit derived from having the operation performed.

TABLE III.

Cause of operation	*Diseases contracted since tonsillar removal*		*Diagnosis at time of examination*	
Frequent colds	colds	28	colds	13
	quinsy	1	bronchitis	8
	asthma	2	chorea	3
	enuresis	5	asthma	1
	diphtheria	3	influenza	1
	otitis media	4	anemia	2
	rheumatism	2	enuresis	2
	miscellaneous	25	tonsillitis	3
			sinusitis	1
			miscellaneous	21
Mouth breathing	colds	16	colds	7
	quinsy	1	bronchitis	7
	asthma	2	chorea	3
	enuresis	1	anemia	1
	diphtheria	4	influenza	1
	otitis media	1	enuresis	1
	rheumatism	2	tonsillitis	2
	miscellaneous	25	sinusitis	1
			miscellaneous	18
Malnutrition and anemia	colds	4	colds	2
	diphtheria	1	bronchitis	2
	miscellaneous	13	asthma	1
			anemia	1
			miscellaneous	5
Tonsillitis	colds	9	colds	5
	diphtheria	2	bronchitis	6
	rheumatism	2	chorea	1
	miscellaneous	8	miscellaneous	13
Otitis media	colds	4	colds	3
	otitis media	3	miscellaneous	1
	miscellaneous	2		
Asthma	colds	1	colds	1
	asthma	4	asthma	2
Cardiac lesions	colds	3	colds	1
			miscellaneous	4
Advice of nurse	colds	5	colds	2
	diphtheria	1	chorea	1
	enuresis	1	asthma	1
	rheumatism	1	enuresis	1
	endocarditis	1	myocarditis	1
	miscellaneous	6	miscellaneous	2
Heterogeneous group	colds	1	chorea	1
			miscellaneous	2

The case of stunted growth, a hypothyroid child, was, as would be expected, uninfluenced by the operation, but showed prompt improvement under glandular therapy.

The case of diphtheria was a child in whom repeated attacks of clinical and bacteriological diphtheria occurred; the patient was a diphtheria carrier. Here we find that the operation alleviated the attacks of diphtheria, and also changed this child from being a carrier to a noncarrier.

A tonsillectomy was performed in the case of chorea with two ideas in view; one, the cure of the chorea, which remained unaffected, and secondly, to prevent the occurrence of a cardiac lesion if possible. If we accept the idea that chorea is only a symptom of rheumatism and if the operation is done with the view of removing a possible focus of infection primarily to protect the heart, then this condition is an indication for operation.

From Table II it will be seen that persistently palpable glands of the neck are not and should not be used as an indication for tonsillectomy and adenoidectomy. These glands were found palpable in the majority of our cases regardless of the cause for operation or the kind of operation performed. There is no doubt that the enlargement of these glands is due to some focus of infection in the head and unless the enlargement is directly tracable to a diseased tonsil and adenoids it is doubtful if operative procedure has any effect.

It can be readily seen from Table I that if a tonsil and adenoid operation is to be performed, that tonsillectomy should always be the operation of choice. Our statistics show that those children in whom a tonsillotomy was performed, with few exceptions, were unimproved or grew worse after operation. The prime factor in all cases where this operation is even thought of should be that the physician be perfectly sure that the tonsils and adenoids are the primary foci of infection, that they are not kept secondarily infected from some other chronic focus of infection in the head.

In dealing with children up to fifteen years of age, one must remember that there is a normal hyperplasia of the tonsils and adenoids during this period; that probably one of the functions of these lymphoid structures is to protect the lower air passages against infection, and that these structures should not be removed solely because they are enlarged or detritus is seen in their crypts. Should the physician decide that the tonsils are the primary foci of infection and a tonsillar operation indicated, we believe that his duty is to insist upon a tonsillectomy being performed.

The most important anatomical characteristic of the tonsils consists of fossulæ or crypts that are branching channels extending from the tonsillar surface to the fibrous capsule where they end blindly. The lymphoid tissue that remains after an incomplete tonsillectomy or tonsillotomy undergoes hypertrophic changes and scar tissues form over the cut surface, which tends to produce pockets and partially occlude the remains of the crypts. Instead of eliminating a chronic focus of infection the ultimate result is often worse than the original condition. From an anatomical and clinical point of view a tonsillectomy is incomplete unless the entire tonsil together with its fibrous capsule is removed.

CONCLUSIONS.

1. Tonsillectomy and adenoidectomy are of advantage in tonsillitis and chronic otitis media.
2. Tonsillectomy and adenoidectomy are of value in half the cases, or less, in colds, mouth breathing and malnutrition and anemia.
3. In the other series enumerated in our tables we did not arrive at any definite conclusion because of the paucity of cases.
4. It is our observation that more advantageous results are obtained in the various causes for operation, where a complete tonsillectomy and adenoidectomy were performed. We therefore would advise tonsillectomy and adenoidectomy as the choice wherever such an operation is indicated.
5. Inasmuch as tonsillectomy and adenoidectomy have distinct indications, nurses should not be put in a position of responsibility in judging these indications. We see on an average a hundred children a week, who at the behest of the nurse come to the dispensary for tonsillar removal, children who are otherwise in good health and most of whom have never suffered an illness involving tonsillar and adenoid tissue. A strict admonition is given the mother that these structures must be removed or the child will be excluded from school, the only indication being that the tonsils are visible to the naked eye. It is true that removal of these glands may not be detrimental (denied by the endocrinologist), but that is not sufficient reason, unless there are other distinct medical indications.

Tonsillectomy in Children with Endocarditis and Frequent Tonsillar Infections

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A review of the experimental and clinical literature bearing upon endocarditis, tonsillitis, acute articular rheumatism, chorea and erythema nodosum, gives one the impression if not the conviction that all these diseases are of bacterial origin. Thus; Rosenow asserts that acute endocarditis is always due to bacterial invasion, and that acute articular rheumatism, tonsillitis, chorea, and erythema nodosum are but phases or manifestations of the same disease.

Wood has proved experimentally that the streptococcus and other varieties of organisms can enter the blood stream through the tonsils and produce cardiac, renal and articular infections. He has further shown that these systemic invasions occur sooner and with greater virulence when the tonsils are the primary focus. Oille has recently demonstrated that a streptococcus bacteriemia is present in most cases of active bacterial endocarditis. Detwiller and Robinson found that strains of Streptococcus viridans isolated from the mouth of normal individuals are similar to those isolated from the blood of patients suffering from acute bacterial endocarditis, and that such organisms are capable of producing experimental heart lesions in the rabbit.

Withers holds that the trend of English, German, and American thought indicates that the streptococcus is the most frequent causative organism in acute endocarditis. He presents two cases of acute endocarditis in children, one following a socalled cold in the head and the other what is known as a sore throat. Osler and McCrae mention tonsillitis, arthritis, chorea, and erythema nodosum as the important causes of endocarditis. Osler recommends removal of the tonsils during the acute attack of endocarditis, if the latter can be proven to be of tonsillar origin.

Fleischner advocates tonsillectomy when it can be shown that the tonsils are the seat of a focal infection, whether endocarditis is present or not. Even during the stage of acute inflammation of the tonsils he believes it better to face the dangers of operation rather than the far greater danger of possible endocardial involvement. He remarks, "acute endocarditis is first a surgical, and later becomes a medical condition"; that is to say, if the tonsils harbor the infection which may produce endocarditis, the primary focus should be removed. He cites four cases in which tonsillectomy was done early after the development of acute endocarditis. In one of these patients the murmur disappeared entirely after three years; in another it was scarcely audible after six months; in the third the murmur was present four months after tonsillectomy but was much decreased in intensity; in the fourth case the patient made a good recovery and was in excellent condition six weeks after operation, although the murmur persisted.

St. Lawrence reports a series of eighty-five children suffering from one or several rheumatic manifestations, that is, tonsillitis, arthritis, chorea or erythema nodosum. Of these, fifty-eight had organic heart disease. He found that in eighty-two per cent. of the entire series the tonsils were the site of recurrent inflammation, and that the complete removal of the tonsils was a most important measure in the prevention of recurrent attacks of acute rheumatic fever and its protean manifestations. Of the fifty-eight children with cardiac disease, St. Lawrence found that after operation there was prompt increase in the capacity for exertion.

Bearing upon this brief review of the literature, and illustrative of the importance of the timely enucleation of the tonsils, I wish to report the following cases:

Case I.—Helen F., now eleven years old, first examined in November, 1917, was a pale, undernourished, underdeveloped child of seven, with typical acute articular rheumatism and acute endocarditis. The history was that she had suffered from frequent attacks of sore throat accompanied by fever during the previous year. Between attacks, the child had a poor appetite, was disinclined to play, tired easily and would occasionally complain of palpitation and dyspnea on the slightest exertion. She also had a number of nose bleeds. On examination her throat revealed markedly enlarged and congested tonsils, the anterior pillars were dark red or "corned beef" in appearance. On simultaneous pressure over the anterior faucial pillar and the tonsil, a thick whitish secretion was expressed from the widely open and inflamed tonsillar crypts. The tonsillar lymph nodes at the angle of the jaw were enlarged and tender.

Heart dullness was much increased; heaving and rapid ventricular action was easily noticed, even upon cursory inspection. On ausculation, the apical sounds were reduplicated, there was accentuation of the second pulmonic sound and a rough systolic murmur was present at the apex. The murmur was transmitted to the left, to the base and posteriorly. The roughness of the murmur suggested some pericardial involvement. The ankle joints were swollen, red and tender, and there was also tenderness of both knees.

A diagnosis of acute articular rheumatism, with acute endocarditis and pericarditis, probably of tonsillar origin, was made. Dr. Neuhof, who saw the patient with me shortly afterward, confirmed the diagnosis and advised tonsillectomy as soon as the patient was sufficiently recovered. The child remained in bed for five weeks, she had another similar attack two months later and several attacks subsequently. I removed her tonsils and adenoids in May, 1918. Since then the patient has more than doubled her weight; the original weight was forty-three pounds, and her present weight ninety pounds. With the exception of one attack of grippe during the influenza epidemic, she has had no ailments since operation. The child has remained exceptionally active and has not complained of any palpitation, arthritic pains nor other rheumatic manifestations. She still has a faint systolic murmur over the apex, but it is much decreased in intensity.

Case II.—Ruth O., aged nine years, first came under my observation in January, 1918, with the history of repeated attacks of fever and sore throat for a year. A few days prior to my first examination, there had again developed fever, sore throat, palpitation and swollen and tender ankles and knees. On examination the tonsils were found to be enlarged and inflamed, the anterior pillars red and congested. The tonsillar nodes at the angle of the jaw were enlarged. The heart action was extremely rapid, the entire precordium pulsating with every heart beat. A double murmur was heard over the apex and posteriorly. The child remained in bed for four weeks. During the succeeding six months she had several similar attacks.

I removed tonsils and adenoids in May, 1918. Her weight increased from thirty-five pounds to fifty-five pounds. With the exception of an occasional attack of bronchitis, she has remained well. Despite the fact that she is exceptionally active she never complains of palpitation or of arthritic symptoms. She has retained, however, a loud systolic murmur over the apex, but her heart is well compensated.

EVIDENCES OF TONSILLAR INFECTION.

The following four points seem to me of importance as evidence of localization of primary focal infection in the tonsils:

1. A history of repeated sore throats. Such history can usually be obtained. By sore throat I do not necessarily mean frank follicular tonsillitis. Experience has shown that a patient may suffer from frequent follicular tonsillitis and show no systemic disorders or sequelæ beyond the febrile disturbance at the time of the attack. On the other hand, a patient may never have had any attack of follicular tonsillitis, he may even never complain of a sore throat, yet his tonsils may be the site of a focal infection through which organisms and toxic material may gradually or suddenly be absorbed or thrown

into the circulation, thus causing the various rheumatic manifestations already referred to.

Such difference in action between acute follicular tonsillitis and a chronically inflamed tonsil may perhaps be best compared to other organs where evident inflammation produces spectacular local symptoms, while the slow insidious inflammation of the same organs may be later responsible for farreaching serious systemic disorders. Alveolar inflammation, for example, causes no more than a local abscess, while an apical tooth abscess although minute, difficult of recognition and diagnosable by the aid of the x ray alone, may be the cause of socalled chronic rheumatism. Similarly acute appendicitis may cause violent acute illness calling for immediate and radical intervention, while chronic appendicitis may produce chronic dyspepsias lasting for years. Indeed, is it not possible that many etiologically puzzling systemic diseases, such as myocarditis, arteriosclerosis, chronic nephritis and diabetes have their origin in some insidious chronic infection in the body not recognizable by our present crude methods of dagnosis, but which we hope later to be able to recognize and treat medically or surgically before systemic effects become manifest? As far as the tonsils are concerned, fortunately, they can be easily seen and examined, and if we can establish the relationship between diseased tonsils and rheumatic manifestations, it should call for early removal of the tonsils, even before rheumatic symptoms set in. This applies particularly when the onset of cardiac disease is feared.

2. When the tonsils are diseased, the anterior pillars present a characteristic red, "corned beef" appearance. This is in marked contrast to the remainder of the mucous membrane of the oropharynx. The characteristic color may be confined to a narrow strip of the free border of the pillar, or in some neglected cases, the entire pharynx may present this appearance. A pillar of this color always denotes a chronically diseased tonsil. This coloration of the anterior pillar is especially noticeable in the chronically diseased tonsils of adults.

3. Simultaneous pressure on the anterior pillar and on the tonsil with two tongue depressors, one held in each hand, causes exudation of a cheesy whitish material.

4. Most cases of chronically inflamed tonsils, particularly in children, show enlarged tonsillar lymph nodes at the angle of the jaw. During an acute exacerbation these nodes may also become tender.

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Early Effects of Combined Endocrine Therapy in Defective Children

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In presenting this communication to the profession I do so with marked misgiving. First, I realize it will meet with the openly expressed contempt of men in the ultraconservative group to whom endocrine study is merely a mirage filled with extravagant absurdities on a par with chiropractic; in the second place it will be greeted with open arms by the overenthusiastic group who will at once start administering with reckless abandon parathyroid extract to all sorts and conditions of patients who by any means can be diagnosed as parathyroid minus. To the first group I can only say that the history of medicine records no chapters dedicated to those who helped preserve her purity by aloofness and contempt for the different opinion. To the second class let me warn against the expectation of any miraculous therapeutic triumphs. Time alone can tell to what degree my observations were sound.

For the last twenty-two months I have endeavored by extensive therapeutic experimentation to determine to an exact if somewhat limited degree the possibilities of endocrinology as a branch of practical medicine. The striking results obtained in my work in those cases of hypothyroidism which I reported early last year and my more recent paper on adrenal insufficiency led me to hope for like results in those obscure clinical entities which have heretofore been placed in that rather vague and discouraging category known as defective children.

In my selection of cases for study I chose from a number of hitherto unbenefited cases, two of the socalled pronounced hopeless cases exhibiting incoordination of a marked degree. The number of cases is decidedly too small and the time of observation too short to draw any positive conclusions. Yet, the effects obtained have been so striking that they seem well worth reporting in this preliminary manner.

The outstanding symptoms in both these children were the incoordination of muscular movements marked by a swaying of the body in an aimless manner with particular inability to hold the head in any fashion approaching the normal. The first patient was ambulatory, but walked with a halting motion and when at rest swayed in an agitated manner from side to side. The second patient, although not ambulatory, showed a marked disposition to walk and made brave attempts to use her legs, throwing them forward in a spasmodic manner when held in a standing position, a distinct peculiarity being a high arching of the instep with hyperextension of the great toe. Attempts by either child to grasp an object were futile, the best being an incoordinated brushing of the hand against the object with no concentrated closing of the fingers over it. These efforts were being made continuously while the children were in my office, a standing object being invariably toppled over. The facies of the patients were characteristic of the existing physiological disturbance, exercise of the facial muscles resulting in distorted grimaces, while the second patient drooled incessantly.

The children when at home carried on coherent verbal exchanges with the parents and near relatives, while in the office neither child had spoken to me spontaneously or when questioned. This, I believe can partly be attributed to the natural bashfulness of childhood which was more accentuated in these children. I make mention of this because I believe that the mentality as far as the power of expression was concerned was retarded, but not deficient. Neither child at the time I was consulted had ever been able to attend to any part of its personal toilet. Unmethodical attempts at dressing themselves had been made by both patients. The first patient had a lack of bladder control, nocturia having persisted over several years' time without improvement. The second child exhibited no defect of control of either bladder or rectum.

In making a diagnosis in these cases I was confronted with a decidedly difficult task. The parents of these children had been the rounds of all the legitimate specialities with equally discouraging results. Among the diagnoses proffered by the neurologist was Friedreich's ataxia. The pediatrist thought pressure due to cerebral hemorrhage due to intrauterine or extrauterine trauma was the cause, although in neither case had the child been delivered with forceps or the mother been subject to external violence during the pregnancy. An internist consulted by the parents in the first case reported believed the child to be affected with Tay-Sachs disease. Both children had been under observation and treatment for three years without any perceptible change in their condition.

When I was first consulted by the parents of these children I could not reconcile the history or symptoms with any of the previous diagnoses made. After a thorough research of both family histories and a careful eliciting of the case history, I leaned toward the diagnosis of a disturbed calcium metabolism due to parathyroid deficiency as the cause of the muscular incoordination.

I first considered Friedreich's ataxia which was one diagnosis made in the second patient. I ruled it out because there was no hereditary or familial influence which might be given consideration. I believe the age of two years also is against Friedreich's. The knee jerks were normal, while in Friedreich's we find them absent. No nystagmus was present. Salivation was a prominent symptom, while in Friedreich's we find it among the rare symptoms. There was no paralysis, a characteristic of Friedreich's ataxia.

Trauma due to intrauterine or extrauterine violence I felt had no place in the differential diagnosis of either case, as no history of anything which might suggest such a possibility was elicited from the parents of either child. The birth of each child had been spontaneous and in no sense was labor either prolonged or extremely tedious. Yet, this as an explanation was proffered to the parents time and again by the physicians consulted.

Tay-Sachs disease, the diagnosis given in the first case, was made when the child was three years of age which alone I believe would make it incompatible with the remaining symptomatology. However, there was no evidence of visual disturbance or paralysis affecting any part of the body, two symptoms which develop in the early months of life in cases of this type.

The various diseases of the central nervous system and new growths of the brain were eliminated by careful neurological examination corroborated by the röntgen ray study of the spinal column and head of both cases. Negative Wassermanns of the blood and spinal fluid eliminated lues as a factor to be considered. No familial taints of alcoholism or mental deficiency were elicited. Idiocy in its various types was studied with particular reference to the physical symptoms. I hope within a short time to make a report on the mental aspects in these cases. The muscular atrophies and dystrophies could not be given serious consideration because there was no evidence of loss of power in any of the muscular groups or the lower extremities, or signs of the pseudohypertrophic or hereditary types of dystrophy.

In two children whose muscular incoordination bordered on the convulsive state and in whom a careful differential diagnosis had been carried out, what else could we consider outside a lack of nerve cell moderation? Where else shall we look for a cause of this lack of moderation than in a disturbed calcium metabolism? What gives a marked loss of calcium but deficiency in parathyroid secretion?

The answers to these pertinent interrogations are found in the case histories given below:

CASE I.—M. K., a female aged six years, was first brought to me August 10, 1921, by her parents. When first confronted with the child my attention was at once drawn to the swaying of her entire torso and the jerky unmethodical movements of the extremities. The head was carried in a manner suggesting not one of muscular weakness, but rather that seen in a person who is being tormented by tickling the back of the neck with a feather. The facies of the girl was of a peculiar and distinctive character, a series of distorted expressions resulting from any play of the facial musculature.

Attempts at handling any object were futile, the object being reached for in a halting, jerky manner and when reached toppled over by the palm of the hand, ability to close the fingers over it being lacking entirely. The manner in which the legs were exercised bore a close resemblance to the faulty movements of the upper extremities.

The skin was soft to touch, the teeth were in fair condition, and the throat revealed a remnant of lingual tonsil on each side. Ophthalmoscopic examination of the eye grounds revealed no abnormality. The thorax was normal in contour, the heart normal in all aspects and the lungs gave no adventitious sounds. The abdomen and extremities were negative and the deep and superficial reflexes normal.

The urine was negative over a series of bimonthly examinations. The blood and spinal Wassermann reactions were negative. The x ray of spinal column and head revealed nothing in the nature of a new growth or subluxation.

It might be timely to mention that the child had been on thyroid treatment for a period of three years, from the age of two years and six months up until she was five years and six months. Tonsillectomy was performed at two and a half years. On August 10, 1921, the patient was put on desiccated parathyroid gland one tenth gram, desiccated pineal gland one tenth gram, and desiccated suprarenal gland three grams. The pineal gland I gave with the hope that it might have a beneficial effect upon the mentality. The patient was seen two weeks later and the same treatment continued.

On September 10, 1921, the patient was again brought to me and the agitated condition of her musculature appeared somewhat improved. The medication remained unchanged and the parents were instructed to return in one month.

October 9, 1921, my clinical notes read: The child appears greatly benefited by the treatment. Control of her muscle group is to a great extent that approaching the normal. The mother volunteered the information that friends and neighbors had commented on the improvement. Medication continued.

December 16, 1921. The physical aspect of the patient has improved to such a marked degree that the hitherto inability to walk about in a normal manner has entirely disappeared. The child now seems to have a well developed control over the various muscle groups of the upper and lower extremities and carries the head erect and steady. The mother reports that the urinary control has improved to such a degree that wetting no longer takes place during the day time, inquiry, however, has still to be made, the child never volunteering to tell the mother when the impulse to micturition is present. Incidentally the child seems greatly improved mentally also. Since her last visit she has distinguished colors, something which she had never done before. Her emotional control appears better also. Calcium chloride, five grams, were added to therapy by mouth three times a day.

January 16, 1922. I placed the patient standing on the examining table and she was undismayed at the procedure. Her equilibrium was perfect and she in no wise appeared frightened. (The child had never been able to control herself before when placed on any object above the height of an ordinary chair, an observation the parents had made long since when sitting her on a table of any convenient height to make dressing more convenient.)

February 13, 1922. Notes made on the patient's record chart for this visit are as follows: Ability to coordinate is excellent, the parents report that the child is now making marked progress in the ability to feed herself. The urinary control is better than it has been in three years. This is the last time I have seen the patient. A letter of later date tells me she still makes progress.

Case II.—G. F., a girl, aged twenty-two months, was first seen by me July 30, 1921. "The child has been backward" was the way the mother introduced the history. She had never walked and when seated was in continuous motion, tossing her head and arms about in a manner closely resembling that noted in Case I. When held in a standing position she would throw her feet forward in a spasmodic fashion, arching the instep high and hyperextending the great toe.

The patient had been treated for malnutrition in her first year, being breast fed until the mother contracted influenza.

July 30, 1921. The child was given desiccated parathyroid, one tenth gram; pineal, one tenth gram, and three grams suprarenal.

A detailed account of this child's progress reveals the astonishing manner in which endocrine deficiencies respond to treatment, an idea of which may be gleaned from the clinical notes of the case three months after treatment was instituted.

November 30, 1921. The ability to grasp objects had improved immensely, the child holding and mimicking my movements with the percussion hammer. She had stood alone and walked several steps unaided, getting about in a remarkable fashion when using chairs and such supports.

The notes of January 19, 1922, the last visit on which I saw the patient, read as follows: Walks behind perambulator without assistance. Stands alone and has walked as much as five steps across the room unaided. Rides a kiddycar steering in and about the objects in the nursery, balance being maintained in a splendid fashion. Drools much less frequently. Her improvement is such that it has aroused general comment among all who know her.

In both cases studied the restoration of coordination and equilibrium has been made to such an extent that the patients are no longer a source of concern to the parents when out of their sight. In one case bladder function has improved to a degree where the patient is no longer a nuisance. One patient no longer drools so continuously as to be offensive. Both patients have improved so much generally that they give great promise of not passing into adolescence as social burdens.

SUMMARY AND GENERAL CONCLUSIONS.

The purpose of this study is not an attempt to dogmatize on endocrinology; it merely conveys the efforts obtained in two cases in which all other therapy was given a fair trial and failed. I fully realize how far we are from exact diagnosis in endocrinology, how uncertain a state endocrinology is still in physiologically; and how large an element of error there is in these cases I have no way of ascertaining. Also, I believe that a longer period of observation is necessary before any final conclusions are made. Yet, the striking results obtained are more than mere coincidence and should lead us eventually to a better understanding of one of the various phases of endocrine study.

164 South Street.

Tuberculosis of the Hip

By B. FRANKLIN BUZBY, M. D.,
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Tuberculosis of the hip occurs next in frequency to tuberculosis of the spine, which is the most common site of bone and joint involvement, and, like all tuberculosis, it is frequently overlooked in its early stages. Since the resulting bone destruction and deformity is in direct ratio to the earliness of diagnosis, I feel that it is of prime importance to bear in mind the early signs and symptoms and so be able to institute immediate appropriate treatment.

Ninety-two per cent. of all cases of tuberculosis of the hip begin before ten years of age. Sex and race have little bearing. The condition is always secondary to a tuberculous focus elsewhere, usually in the bronchial or mesenteric lymph nodes, and the bacteria are carried by the blood stream to some *locus minoris resistentiæ* and there deposited to form new tubercles.

The history of previous injury to the infected joint is not constant, and when elicited the injury is found to have been slight, and since all children have frequent trivial injuries to joints, this point is probably unimportant. Certainly tuberculosis rarely, if ever, follows a severe injury, such as a fracture, due probably in some part to the prolonged care and attention given the patient at this time.

The pathological picture primarily is the lodgment of a tuberculous embolus in the red bone marrow of the epiphysis most frequently or in the synovial lining of the joint less often. This is true because these structures are rich in endothelial and lymphoid cells which are essential to the formation of tubercles. Elsewhere in bone the bacteria seldom survive. This explains also the low incidence of tuberculous arthritis in adults whose bones do not show the red marrow present at the epiphyses in children. Frequently an area of sclerosed bone is seen around the primary focus of infection which may be caseating, and, if the condition persists, a rarifying osteitis takes place in the surrounding bone. As the process progresses, the articulating cartilage is rarely the first joint structure to be involved, for this seems to resist tuberculosis. Instead, the synovial membrane is next the seat of the disease again because of its histological makeup, and it is first attacked at its capsular attachment. Later the cartilage is covered by a villous fungoid growth, and then subsequently it becomes invaded and perforated by the tuberculous process.

While it is true that almost always the joint infection is secondary to bone involvement, sometimes this procedure is reversed and the synovia is primarily involved. This type is always severe early, but even here the cartilage is not primarily active in the tuberculous process. In spite of the severity of the initial condition in this type the tendency to healing is greater where the bone is not involved, provided treatment is begun at once and kept up for a sufficiently long time.

Frequently a serous effusion is present in the joint even before the arthritis becomes tuberculous, due to the neighboring bone focus. Once the joint is involved there is little or no fluid, but instead it is the seat of a villous arthritis with the formation of socalled rice bodies from the detachment of the villi. Nature's effort to combat the disease results in the caseation and cold abscess formation, which material is added to by sequestral bone. Cold abscesses are formed by the extension outside the joint capsule of the tuberculous granulation, and the process then follows along the line of least resistance, that is, burrowing along muscle planes, and so reaches the surface. Should healing take place it occurs by encapsulation of the tuberculous process by means of fibrous tissue the same as elsewhere in tuberculosis, and, naturally, at any time when the patient's bodily resistance is low, due to intercurrent disease or injury, the process again starts up with renewed vigor.

Secondary infection can occur either through the blood stream or more frequently by means of the entrance of pyogenic cocci through the overlying thin skin of a neglected cold abscess or through the sinuses of cold abscesses which have been permitted to rupture spontaneously. This secondary infection aids in the more rapid disintegration of the diseased area and adds an undesirable complication in that it also makes the tissue more vulnerable to the tubercle bacilli.

The symptoms are variable and none can be called cardinal although the limp and the muscle spasm which resists motion in all directions might be termed the most constant. The limp is due to pain and also to the early deformity when the thigh is held in about thirty degrees of flexion. Muscle spasm is nature's effort to splint the joint, and if with the patient stripped and motions tried first in the normal and then in the diseased hip, it will be found that all motion is limited, but especially extension, adduction and rotation, the former being almost impossible. The pain is not infrequently referred to the inner side of the knee due to irritation of the obturator nerve. The pain is also not constantly present when the child first gets out of bed after a night's rest, but grows worse as the day's play progresses and is most severe in the evening. Night cries due to muscle spasm are frequent. On standing erect it is noted that there is a lumbar lordosis due to the patient compensating for the fixed flexion of the thigh in an effort to get the foot to the ground, and it will be seen also that there is some abduction of the hip which with the flexion explains another finding—flattening of the buttock on the affected side and disappearance of the gluteal fold. There might be slight atrophy of the thigh on the affected side. There is some thickening palpable through the region of the hip joint most marked just below Poupart's ligament anteriorly and behind the great trochanter posteriorly. There is usually a rise of temperature of 1.5° to 2° F. in the evening, with loss of appetite and malaise. The x ray is valueless at this stage for the changes are so slight as not to be demonstrable, but this early stage is the important one in diagnosis. If a tuberculous focus can be demonstrated elsewhere in the child's body, or if the Von Pirquet skin reaction is positive, or if a positive reaction can be obtained by the injection of old tuberculin, it is safe to presume in a child under ten years of age that the condition is of tuberculous origin and should be treated so until proven otherwise.

On account of the position in which the leg is held there may be apparent shortening, but if the extremities are measured in the same position of angulation in relation to a line between the anterior superior spines of the ilia, it will be seen that both limbs are of the same length. Shortening comes only after the destruction of the femoral head or acetabulum with subluxation.

As the disease progresses other signs appear and those already present become aggravated. Bone and joint destruction are prominent findings, and it is this later stage which in many men's minds constitutes tuberculosis of the hip, whereas in this stage it is not a question of diagnosis so much as one of prognosis. It is in the earlier stages that so much can be done to prevent sinuses, bone destruction and deformities, and muscular contractures. It is like the older textbooks on surgery stressing enlarged axillary lymph nodes as a sign of carcinoma of the breast. Prognoses at these stages are far from good. Here constantly in hip disease, by means of the x ray, we see the destruction of the head of the femur and the shadows of cold abscesses. The thigh is fixed in flexion, and frequently in adduction by muscular contractures, which in turn produce lordosis and elevation of the ilium on the affected side with shortening more apparent than real. Large superficial veins are seen overlying the joint, and the periarticular structures are definitely thickened and indurated. Abscesses may be pointing on the outer side of the thigh or in the buttock when the femur alone is involved, or if the acetabulum also is the seat of destruction, the abscesses from this source will point on the inner side of the thigh. The lymph nodes along the iliac vessels on the affected side are enlarged and tender. The patient's general health and nutrition will be bad, and there is no doubt now that the disease is serious and the prognosis not the best either as to function or life.

Many conditions may simulate tuberculosis of the hip, the most frequent being Perthe's disease and syphilis. The symptoms and physical findings in cases of syphilis are almost identical with tuberculosis, but in the presence of a positive Wassermann reaction (a test which should be made in all monarticular joint lesions) a suspicious history and other stigmata of congenital lues, and in the absence of positive results from specific tests for tuberculosis, appropriate antiluetic treatment should be instituted. This differential diagnosis is important because normal return of function can be hoped for in syphilis, and if bone destruction has not progressed too far the treatment would not be prolonged fixation, whereas rest and fixation are of prime importance in tuberculosis.

Perthe's disease is also very difficult to differentiate clinically, but here the x ray comes to our aid, and the picture in this disease is a widening of the neck of the femur, a fragmentation of the epiphysis with a chronic inflammation of this structure, later a mushrooming of the head and a coxa vara. At all times the joint outline is very distinct and unimpaired and there is no destruction of the cartilage or head of the bone. The cause of this condition is not definitely known, but one writer reports finding a pure culture of staphylococcus in the joint, thus making stronger the feeling that it is an infectious arthritis.

Other conditions which must be borne in mind are congenital dislocation and coxa vara, which can be definitely ruled out by the x ray, and in the former also by a careful history, the gait, and by Trendelenberg's sign. Strain or sprain does not persist as does tuberculosis, and with this type of synovitis and with epiphyseal separation the patient distinctly remembers the injury. Retroperitoneal adenitis and appendicitis can cause a fixed flexion of the thigh, but here a careful physical examination will be of value. Iliopsoas and gluteal bursæ and cellulitis can be ruled out by watching developments under rest for a brief period. Osteomyelitis affects the shaft of the bone and not the epiphysis. Pott's disease with psoas abscess would easily be discovered on inspection and examination of the back.

Infectious metastatic arthritis is rarely persistently and progressively monarticular. Chorea and pseudomuscular hypertrophy must be borne in mind as well as hysteria. In the latter the symptoms are usually those of the advanced stage of the disease while the x ray is negative. One should be careful, however, in making this diagnosis. Lastly, growing pains, whatever they may be, must be thought of, usually because that is the diagnosis of the family. These are in reality due to some definite disease of the epiphyseal tissues, usually not progressing beyond the hyperemic stage of inflammation, and are usually benign and abortive. This condition is frequently brought on by overexertion or some frequently repeated trauma, such as jumping.

Treatment is dependent upon two main principles, rest and fixation, with all other factors of secondary importance. By rest is meant absolute rest in bed until at least two months after all acute symptoms have subsided. Fixation is begun coincident with the rest in bed and is kept up for years even if the case is seen early.

Absolute rest is best obtained by strapping the patient to a Bradford frame not wider than the chest so that movement is impossible, then also by traction on the affected leg by means of Buck's extension and weights so that the pull is in the line of deformity and kept up until muscular spasm is overcome. Then later by changing the axis of the traction the deformity can be overcome. The pain, fever, beginning abscess and ill appearance of the patient, rapidly subside under this treatment. From the beginning, however, it is wise to institute general hygienic care and see that plenty of fresh air and sunshine and good wholesome food are given, for unless the joint tuberculosis is combated in this way also, some distant tuberculous complication may set in and carry off the patient. In addition to these helps in treatment, tuberculin in very small doses has been advocated by some observers, notably the

Germans, but Kleinberg, of New York, after a large experience with it feels that it is without value and in many cases actually does harm. When used the patient must be carefully watched for reaction, and if it occurs the dose must be cut down. Rollier states that heliotherapy with direct exposure to the sun's rays, the short rays being the valuable ones, at an altitude of about four thousand feet, gives an absolute cure in two or three years, with little or no ankylosis, this being due, he says, to the alterative, analgesic, bactericidal and sclerogenetic action of the solar rays. Unquestionably this is quite an adjunct to the treatment, but without paying strict attention to the before mentioned mechanical and general hygienic aids, one would not have universal success.

When healing does occur, as has been stated, it is by fibrosis, and it is this scar tissue formation that is aimed at. Rarely if ever is the resulting joint ankylosis bony and complete except in case there has been secondary pyogenic infection which causes osteogenesis, whereas tuberculosis uncomplicated is essentially a destructive process.

The local complications requiring treatment are abscesses and sinus formation. Should an abscess continue to enlarge in spite of treatment so that it is nearing the skin surface of the thigh and is in danger of rupturing spontaneously, it is far better to incise it aseptically through healthy tissue anteriorly and evacuate the pus and swab the cavity out with iodoform gauze and close without drainage. Fully seventy-five per cent. of abscesses treated in this way heal by first intention, whereas if they were permitted to rupture spontaneously or were opened as one would open a pyogenic abscess, all would become secondarily infected with pus forming organisms, and further complications would occur.

In the treatment of sinuses full exposure of the part to sunlight or artificial electric light is of great benefit in aiding the growth of healthy granulation tissue. If this fails, injection of the sinuses with Beck's bismuth paste is sometimes of value, especially if the discharge is not free. Tuberculin in very minute doses combined with autogenous vaccines has been used advantageously. If all these fail then the wide opening of the sinus tract with the removal of granulations and sequestra can be done and thus permit healing from the bottom by granulation tissue and aid this by sun's rays or electric light.

If after the general health has been fully restored by hygienic measures, it is impossible to overcome the muscular contractures by traction, the deformity should be relieved by tenotomies, but not in the presence of infected sinuses or large cold abscesses, because it might be subjecting an otherwise convalescing joint to secondary infection.

If after the deformity due to muscular pull is overcome the joint is still fixed in flexion and adduction and a sufficient period of traction has elapsed to reduce the fibrous ankylosis of the joint in the malposition, and the deformity is still present, a subtrochanteric osteotomy of the femur should be performed which would preserve the ankylosis but overcome the deformity. This should be done with a saw rather than an osteotome so as to prevent fragmentation of the shaft of the femur. The limb and back are then placed in the desired position and held there by a plaster cast extending from the toes on the affected side well up to the axilla so as not to allow rotation of the pelvis, which in turn permits hip motion and thus defeats the purpose of the operation. Occasionally it is necessary to include in the cast the well hip and thigh to the knee as an extra aid in fixation.

The object of all this is to aim at permanent fixation by ankylosis of the diseased hip. Stiffness of a joint alone is never an indication for operative interference if the position is fairly good, for ankylosis is the ideal result. The position of choice for ankylosis is from twenty to thirty degrees of flexion and ten degrees of abduction, which permits both walking and sitting in a fairly comfortable and stable position.

When all pain, fever, muscular spasm and fluctuating areas have been absent two months or more, ambulatory treatment is next in order, but this only with the involved extremity absolutely fixed. This is obtained at first by a cast from the toes to the axilla and a high shoe on the well side, and crutches. This keeps the patient away from weight bearing and is the same as continuing traction. The primary symptoms soon return unless this procedure is kept up for six months at least after bed treatment is discontinued. In hot weather after the cast has been worn for a shorter period, a Thomas hip splint may be substituted, but continuing the crutches and high shoe. These may be later replaced by a splint such as the Davis hip splint, which permits motion at the hip. Motion should be tried before weight bearing and should any untoward symptoms occur, motion should be again stopped. If motion causes no ill effects, weight bearing can be gradually restored by first taking away the high shoe and later the crutches, but leaving the brace. This alone should be worn for six months or more, but the patient will try walking without the brace before the expiration of this time usually, but it should be permitted with caution and only in the house at first. Subsequent checking up the physical findings and x rays at intervals of from three to six months is necessary for years.

Ely advises early operation to destroy the joint surface, and thus aid nature in her efforts to produce ankylosis, asserting that if the joint function is done away with, so are the synovia and lymphoid elements, consequently the tubercle bacilli have no place in which to propagate, and the process ceases to progress. He states that the joint is thus destroyed and bony ankylosis occurs by primary union, and thus the convalescence is greatly shortened, which is of importance in the child of school age.

Excision of the head and neck is almost never necessary in children. When done it is in an endeavor to keep away from amputation in severe cases of sepsis. It is more frequently necessary to do this in adults, but here the resultant deformity is less. In any case where the head of the bone is gone, open operation, with the placing of the upper end of the femur in the acetabulum, results in a stable and painless but stiff hip.

If after sufficient time has elapsed to preclude the possibility of starting anew the infection, i. e., at least two years after discarding the brace, arthroplasty of the hip with interposition of fat flaps may be attempted, and even should it fail the result would be an ankylosed joint in the position of choice should the post operative course be carefully supervised.

PROGNOSIS.

According to Sundt at the Fredriksvern Hospital in Norway, thirty per cent. of all cases admitted to that hospital between 1903 and 1918 with the diagnosis of tuberculosis of the hip were found to be non-tuberculosis, and of these forty-three per cent. were Perthe's disease. These patients always recover under proper care. If this is true then the mortality from true tuberculosis of the hip is very alarming and the prognosis is severe, since most observers assert that the mortality from tuberculosis of the hip in general, which formerly included both Perthe's disease and syphilis before these two were really recognized as such, is about forty per cent., the death being the result of conditions to which the ordinary child would not be subject, such as pulmonary and meningitic tuberculosis and sepsis.

With these startling statistics in mind it behooves all of us to pay particular attention to the early diagnosis and treatment of all hip disease, for, as has been said, the prognosis as to function and cure of tuberculosis of the hip is in direct ratio to the earliness of the diagnosis.

4427 Walnut Street.

Bees' Honey in Substitute Infant Feeding*

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> Buttermilk and honey shall he eat, that he may refuse the evil and choose the good. (Isaiah vii:15.)|
>
> The yellow banded bees . . . fed thee, a child, lying alone, with whitest honey, in fairy gardens cull'd. (Tennyson, *Eleanore.*)

Bees' honey is one of the most widely distributed foods and has been used as such and as a medicine from time immemorial. The sacred books of India, China, Persia and Egypt speak of honey in laudatory terms. The Old and New Testaments, the Talmud, the Koran and the Scandinavian Sagas refer to its invigorating and medicinal properties. The Greek athletes ate honey before entering the arena and even their gods were said to feed on ambrosia, a mixture of milk and honey. The Nordic god, Odin, feasted on mead made of honey, and the heroes were promised to use it as their exclusive beverage in the Valhalla. The Greeks and Egyptians fed their children milk and honey and it is still used in Iceland as an infant food and hypnotic. In Palestine, the land of milk and honey, it was reputed to strengthen the understanding and to this day Bedouin and fellah children get their daily rations of buttermilk and honey. Pythagoras, Diophanes, Anacreon and other Greek and Roman philosophers ascribed their long life to their daily use of honey. Plutarch calls it the heavenly saliva, *saliva siderum.* The Roman formula for the attainment of a ripe old age was: *"oleo externus, internus melle."* One of Titian's pictures shows the infant Jesus holding a bee in his hand. Homer, Euripides, Ovid, and Virgil have composed immortal verse celebrating honey, and Hafiz as well as our modern poets sing of honey lips, the negro mammy coos "my little honey" and since the time that Eros dipped his arrow in honey, the happiest time in a mortal's life has rightly been called the honeymoon. Hippocrates and Celsus as well as the Arabian physicians prescribed honey as a laxative and expectorant and it is still used in folk medicine as a cure for a multitude of ailments.

That such a wholesome food should have been given up as a staple article of diet, is a sad commentary on the intelligence of socalled civilized people. The tendency of the urban population to follow the path of least resistance and substitute sugar which is more easily obtainable and slightly cheaper, as well as the extensive adulteration of honey are the sole reasons for the neglect of such a wholesome natural food. But the time has come to reinstate honey to its former preeminence.

While the substitution of cane or beet sugar in the dietary of the adult is of secondary importance, the caloric value being the same (1,520 and 1,860 calories to the pound of honey and sugar, respectively), it is of prime importance for the child and especially for the infant whose diet is restricted. For an infant who may have no other source of mineral salts and vitamines, the substitution of sugar may become a distinct menace to health and even to life. This will become more apparent when we consider the composition of honey.

COMPOSITION OF HONEY.

As everyone knows, honey is the saccharine liquid collected by the domestic bee (*Apis mellifica*) from the nectaries of various flowers; being first stored in its crop, where it undergoes predigestion, and later in the wax combs of the hive where it undergoes further inversion and concentration. Ripe honey is a yellowish, syrupy liquid with a characteristic odor and aromatic taste, followed by a slight prickling of the tongue. Its consistency, color and flavor varies with age, place of production and the flowers from which it is collected. The nectars from orange, basswood, clover and linden are reputed to give the best honeys. Honey is acid in reaction, turns the polarized light to the left and dissolves readily in cold water; less so in alcohol.

The chemical composition of honey varies exceedingly, no two analyses being alike. The water content differs according to the amount of rainfall in the locality of its production and the amount of moisture present where it is stored. The thirty-two honeys I have analyzed within the last five or six years showed the following average composition:

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*Read before the Bronx County Medical Society, March 15, 1922.

	Per cent.	
Levulose	39.10	
Dextrose	34.00	
Water	17.20	Driven off at 100 degrees Centigrade.
Proteins	1.80	
Formic acid	1.10	
Wax	.90	
Mineral salts	.75	Phosphoric acid, calcium, magnesium, iron, traces of iodine, etc.
Dextrin	.45	
Sucrose	.40	
Malic acid	.30	
Acetic acid	.20	
Undetermined	3.80	Resins, gums, bee glue (Propolis), coloring matter, volatile oils, vitamines, etc.
Total	100.00	

The average specific gravity was 1.46 at 15° C.; the water content varying as much as twelve per cent to thirty-three per cent. One tablespoonful of honey weighs a trifle over an ounce and yields about a hundred calories, corresponding to about five sixths of an ounce of cane sugar (one tablespoonful granulated or three and a half lumps) and yielding about 1,520 calories to the pound.

If we look a little closer into its composition, however, we find that although its caloric value is about equal to that of sugar, honey is far superior to it in many respects. Thus, sugar is one hundred per cent. sucrose, a disaccharide which is not absorbed directly; but has to be inverted by the gastrointestinal secretions into dextrose and levulose before it can enter the blood. In honey, the inversion takes place in the crop of the bee where the ferments of the head and thorax glands begin the predigestion of the nectar which is finished in the hive. A good ripe honey contains no sucrose at all and the one I am now using contains neither sucrose nor dextrin.

Honey is thus indicated in any condition of the intestinal tract where the assimilation of starch or the disaccarides is delayed and where prompt absorption of energy is desired. In constitutional inability to digest starch or other polysaccharides, due to lack or diminution of the respective enzymes, honey is a boon, indeed. A solution of honey in water (one teaspoonful of honey to a glass of water) is almost as quickly absorbed as alcohol and its effect is more lasting. I, therefore, prefer it to alcohol, especially in bronchopneumonia. For a long time I hesitated prescribing honey in inflammatory conditions of the intestinal tract such as gastroenteritis, owing to the danger of pollen sensitization; but it was given unintentionally in one case and as there were no ill effects observable, I have continued using it in all cases of summer diarrhea in the proportion of one teaspoonful of honey to eight ounces of barley water.

The largest part of the honey sugar is fructose (levulose), a levrorotatory monosaccharide which seems to have a peculiar affinity for the body cells; thus it is rarely, if ever, found in the urine of diabetic patients. It is more rapidly absorbed than lactose and it has not the disadvantage of undergoing butyric acid fermentation like maltose; hence it does not produce acidosis. Its rapid absorption prevents it from undergoing alcoholic fermentation and infants fed on honey rarely show signs of flatulence.

It is a well known fact that carbohydrates favor the absorption of fat, probably by yielding acids which neutralize the intestinal alkalinity and thus allow the fatty acids to be absorbed as such, instead of forming soapsuds. Honey favors this process by the free acids it contains.

Another advantage of honey over sugar is its protein content, mainly derived from the pollen of plants. The percentage has been estimated at one per cent. to five per cent., according to its derivation; the honey I am now using containing about two per cent. It not only adds to its nutritive value; but in cases where the infant cannot digest casein or other milk protein, it may become the only available source of nitrogenous food during a critical period. That it is capable of sustaining life and building tissue may be inferred from the fact that bees ingest no other azotic food. The special honey set aside for the queen of the hive and known as royal jelly is particularly rich in pollen grains and her extra size as well as her extraordinary vitality could be ascribed directly to this food.

The importance of mineral salts is too well known to need discussion, and although honey contains only small amounts, they are of great value to infants; this is especially true of the iron which human as well as cow's milk contains in exceedingly small quantities. Honey complements this deficiency.

The organic acids, which in some specimens go up as high as two per cent., and are rarely less than one per cent., act as mild stimulants to the digestion and the increase of appetite seen in children fed on honey may be largely ascribed to this factor and possibly to the volatile oils. Children fed on pure honey can easily dispense with orange juice.

The undetermined substances, mainly gums, prepolis (bee glue), resins, and other substances, probably act as roughage and together with the wax tend to increase peristalsis. It has been asserted that the eating of honey containing wax might develop resistance to tuberculosis. This pious wish, probably based on the association of ideas between wax and the waxy capsule of the tubercle bacillus, has no scientific basis; among European peasants honey enjoys a high antituberculous reputation.

I have had no occasion to observe the many vaunted curative powers of honey. The 419 cases in which I have used honey were mostly feeding cases; but I did observe that fresh honey, especially virgin honey directly obtained from the honeycomb, has a decided laxative action which it loses upon boiling. Secondly, fresh honey seemed to have a pronounced soothing effect upon infants. Honeys with strong aromas exhibited this action to a greater extent than those who were comparatively odorless. Those who were fretful before, exhibited a remarkable change of temper after being put on honey. The tendency to fall asleep after feeding was greatly increased. Whether this is due to general improvement, to lessened gas formation or to some hypnotic action, I cannot tell. I have also noticed an increase in the urinary secretion, or, at least, an increased urinary output. Finally I have successfully substituted honey for orange juice and for codliver oil.

Notwithstanding the negative reports of some investigators, I found that fresh honey is abundantly provided with all three accessory food factors which have such a preponderant influence upon animal metabolism.

Hawk and his collaborators (1), experimenting with albino rats, found only minimal amounts of fat soluble vitamine A and water soluble vitamine B in strained honey. In comb honey, the fat soluble accessory factor was found in moderate amounts. These results show the importance of the proper kind of honey for experimental as well as for nutritive purposes. Neither Hawk nor Faber (2) found any antiscorbutic water soluble vitamine C. Faber, however, experimented with only ten guineapigs, insufficiently controlled. Dutcher (3) found small amounts of the antineuritic vitamine in honey.

In my own experiments which will be reported elsewhere I found all three vitamines in eighty-two per cent. of the honeys examined. This, coupled with the other advantages of honey, induced me to discard all other sugars in the substitute feeding of infants. I take this opportunity to plead for the use of the term substitute feeding instead of artificial feeding, now in vogue. The latter term should be reserved for feeding not administered by mouth.

The gross adulterations of honey, so prevalent before the federal pure food law went into effect, when it was possible to palm off, as honey, a decoction of commercial glucose with a dead bee in it, are rarely met now; but there are still a number of honeys on the market mixed with starch, glucose, gelatine, mucilage, chalk, water, and other substances. It is therefore of the utmost importance that the mother or nurse be instructed to obtain a pure product and, in case of doubt, to use comb honey, which is easily obtained from the comb by cutting off the top and allowing the liquid to run out by gravity. Again and again I have had to discontinue the use of honey because it was found to lack the essential elements of its normal composition. I do not refer, of course, to artificial honeys so much in use in Central Europe. Those are no more honey than chicory is coffee. Some of them are such clever imitations that it is almost impossible to distinguish them from the genuine article.

The general practitioner ought to familiarize himself with a few simple tests in order to detect the grosser adulterations. Thus the specific gravity is a good indication of the amount of water. Genuine honey has a tendency to crystallize or sugar, i. e., to form into a soft granular mass. When dissolved with twice its weight of water it should form a clear solution and not a stringy one with a specific gravity of no less than 1.099 which is equal to 1.370 of the original honey. It should react acid to litmus paper and turn the polarized rays of light to the left. Five grams of honey dissolved in twenty grams of water (distilled) should become only faintly opalescent upon the addition of a few drops of silver nitrate or of barium chloride, indicating no excess of chlorides or sulphates, respectively. When one c. c. of absolute alcohol is allowed to flow down the walls of a test tube, one centimetre in diameter, containing two c. c. of a filtered one to four honey solution, the line of contact would show a barely noticeable opalescence, which soon disappears; a permanent milky zone indicating the presence of starch sugar. If half a c. c. of this honey solution is allowed to flow upon two c. c. of pure sulphuric acid, the colored line of contact should not appear at once; at the end of one hour it turns yellowish to clear brown. When a brown line appears which turns black within thirty minutes, it shows cane sugar.

When one part of honey and five parts of water are boiled, allowed to cool and then a little iodine added, the solution should turn neither blue nor green; otherwise the honey contains starch.

It is unfortunate that the average pharmacist does not carry a brand of pure honey. Although *mel* and *mel deparatum* are official United States Pharmacopœia preparations, there is no standard and in fact there can be no adequate standard for such substances as honey. Furthermore, *mel depuratum* or clarified honey is actually robbed of its aroma, taste and vitamines by the pernicious method prescribed for its preparation by boiling. The United States Pharmacopœia should either prescribe the classification of honey by the calcium carbonate and animal charcoal method or drop honey altogether from its list of official remedies. I take this opportunity to suggest that if honey is retained in the next edition of the Pharmacopœia, that its vitamine content as well as that of many socalled complete foods, be stated on the label.

Paradoxically enough, it sometimes happens that honey obtained from the comb is lacking in either the vitamines, organic acids, levulose or all three of these constituents. This fact which puzzled me for a long time I finally traced to the habit of some farmers to feed their bees with molasses, especially when there is a scarcity of flowers or when the season had been an unusually rainy one. The bees gorge themselves with the sugar in the vats in front of the beehive which they immediately deposit in the combs without giving it a chance to undergo inversion. Under this system the producer can swear that his product is pure bees' honey; but it is, nevertheless, an adulterated article unworthy of its name and lacking all the properties of real honey.

Finally, a word as to the storage of honey. The statement is often found that honey should be stored in the icebox. In my experience it should be the last place for the storage of honey, which owing to its hygroscopic property absorbs moisture and is likely to spoil. A dry place is the first choice and if it can also be cool so much the better; but it must be dry before anything else. During the war the price of honey was very high; but now it can be bought at prices which compare favorably with that of sugar, especially when bought in wholesale quantities.

I now use honey as a routine component of all my formulæ for substitute infant feeding. Wherever there is an indication for sugar, lactose or maltose, I invariably substitute honey and the results obtained in 419 cases studied so far encourage me to plead for a more general use of honey by the profession. The proportion is one teaspoonful of honey to an eight ounce bottle of the feeding mixture.

I am also using honey more and more extensively in marasmus, rickets, scurvy, malnutrition, and other conditions, in which I formerly prescribed the various sugars, codliver oil or patent foods.

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Hemorrhagic Disease of the Newborn*

By ALBERT D. KAISER, M. D.,
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The term hemorrhagic disease of the newborn was applied by Townsend to the condition in which small or large effusions of blood occur simultaneously in many different parts of the body independent of any discoverable cause. This socalled hemorrhagic tendency was first described by Minot in 1852. Little in 1861 emphasized the relationship between birth injuries and spastic conditions that developed later but it was not until 1885 that Sarah McNutt established the relationship between cerebral hemorrhage and Little's disease of later life. The condition was early recognized as distinct from hemophilia as there was no tendency to bleed in later life.

The etiology of hemorrhagic disease of the newborn is still one of the obscure problems of medicine. It has been demonstrated that there is a diminution of prothrombin in these infants but why there should be has not been determined. It is possible that the bleeding is due to some peculiarity in the tissues of the newborn infant or it may be a manifestation of some obscure infection. If there is a tissue defect it must either be a developmental defect or an inability to react properly to extrauterine existence. The tissue defect might involve either the blood itself or the walls of the vessels. The disease is not a common one though in any maternity hospital cases occur not infrequently. The majority of reports show a percentage incidence of under two per cent. Green and Swift's reports from the Boston Lying-in Hospital showed fifty-one cases out of 4,455 births or 1.1 per cent. In the Rochester General Hospital maternity department out of three thousand cases reviewed twenty-three cases were found or about eight tenths per cent. In the newborn clinic at the University of Minnesota statistics show that one case occurs in each one hundred births. Undoubtedly undiagnosed cases occur where there is no evidence of external bleeding. The disease is more frequent in institutions than in private practice. A notable seasonal incidence has been reported, the disease being more frequent in the six months from November to April but the cases that I have studied seemed to be equally distributed throughout the year. Syphilis is associated with hemorrhagic disease in only a small proportion of cases.

Hemorrhage may occur in any organ. The gastroenteric tract is the most common locality. Bleeding from the umbilicus is next in frequency. Cerebral bleeding is not infrequently a part of a general hemorrhagic diathesis. Bleeding into the skin occurs and there may be bleeding from the bladder or the kidneys.

There is no constancy in the lesions found postmortem in this disease. In the majority of autopsies nothing is found except the hemorrhage in the various situations and the consequent anemia of the organs. As a rule no lesions are found except areas of congestion or ecchymosis on the mucous membrane.

Except where there is obvious bleeding the symptoms of hemorrhagic disease are indefinite. They usually manifest themselves the first week of life and in the majority of infants during the first two or three days. The cases group themselves in two classifications. In the first, there is obvious bleeding, while in the second there is no external evidence of bleeding. In the socalled cases of obvious bleeding usually nothing is noted until the hemorrhage begins. The most frequent symptom is hemorrhage from the bowel. The blood is always dark colored and usually thoroughly mixed with the feces. In cases where there is hemorrhage from the stomach blood is vomited. The blood vomited is dark brown, rarely bright red. There may be bleeding from the mouth, nose or conjunctiva. Rarely the urine is blood tinged or actually bloody. The bleeding from the female genitals may be severe. Next in frequency to the gastroenteric bleeding is that from the umbilicus. It is likely to occur some time later. The amount of hemorrhage determines the severity of the symptoms. Prostration may occur early with a rapid loss of weight. The temperature may be elevated or subnormal. Icterus is present in about twenty per cent. of the cases.

Where bleeding is not obvious a different group of symptoms must be considered. These are chiefly cerebral symptoms. An apparently healthy looking baby at birth will on the second or third day appear drowsy. Instead of showing an interest in nursing the baby may make no effort to nurse, or if it does swallows with difficulty. There may be a rapid loss of weight, sixteen to twenty ounces in forty-eight hours. The skin feels dry and the color may be poor. There usually is no evidence of bleeding, at any rate not at the beginning of these symptoms. Unilateral or bilateral twitching of muscles may be noted and frequently a convulsion follows or there may even be pressure symptoms suggesting meningitis. It is usually a concealed hemorrhage in the cerebrum or meninges that gives rise to these symptoms. How often cerebral hemorrhage occurs as a local manifestation of hemorrhagic disease has not been ascertained.

Upon the correct and prompt diagnosis of this disease rests the chances for ultimate recovery. There is little difficulty in recognizing bleeding from the mucous or serous membranes. Dark masses passed from the bowel may be confused with meconium. If in doubt a test for blood corpuscles or hemoglobin should be made. Recently in a hospital case the nurses reported blood in the stools of a five day old infant. Inspection of the stool showed numerous dark brown lumps which resembled particles of blood tinged fecal matter. Before treatment was started a similar condition was reported in another baby. Investigation showed these particles to be argyrol which had been dropped in the noses of these babies for rhinitis.

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To diagnose concealed bleeding is a different task. Autopsy reports on newborn babies show that it is often not recognized before death. Dr. Margaret Warwick, in a report of thirty-six necropsies at the University of Minnesota, reported that fifty per cent. showed hemorrhages in the dura over the brain surface or in the ventricles. Only one of these was a forceps case. In eight, or fifty per cent. of those showing cranial hemorrhage, hemorrhages were found in other organs. At the pathological Institute of Kiel, Weyhe reported that in 959 autopsies on infants twelve per cent. showed intracranial hemorrhage. A misconception exists which endeavors to rule out the diagnosis of cerebral hemorrhage unless the infant suffered from a difficult and prolonged labor. Autopsies have shown that intracranial hemorrhages occur in normal deliveries as a part of a general diathesis. If convulsions or twitchings of one or more extremities occur with a bulging fontanelle, nystagmus, strabismus and increased reflexes it is quite likely that there is some bleeding going on. Spinal puncture is then indicated. Blood tinged fluid may be obtained or there may be fluid blood which clots readily in a test tube. If there has been trauma or a protracted labor the presence of these symptoms strongly points to a lesion in the brain.

The most effective weapon in the treatment of hemorrhagic disease of the newborn is human blood, horse serum and thromboplastin. The early injection of human blood or serum has given most favorable results. The mortality figures for this disease range from sixty-two to seventy-nine per cent. They are not recent figures and were probably collected before serum was used as the chief therapeutic agent. In the thirty-four cases I have been able to study there was a mortality of fifty per cent., while in cases treated with serum there was a mortality of only twenty-five per cent. It is interesting to note that of the seventeen deaths in this series twelve patients received no serum or blood, and five received one injection of blood a short time before death. The seventeen infants who recovered all received two or more injections of blood or serum. No reliance should be placed in the administration of calcium or adrenalin when such a specific method of treatment is at hand. At the earliest recognition of either obvious or concealed hemorrhage an injection of whole blood should be given to avoid delay. Sufficient blood should then be taken from the donor, sixty to one hundred c. c. to be set aside to furnish serum for further treatment. From ten to fifteen c. c. of serum should be given every eight hours according to the course of the case. If the infant is so greatly prostrated or exsanguinated as to appear in a serious condition a transfusion of blood would be the safest treatment. Human blood may be either maternal or paternal or indeed from any safe donor. Horse serum, thromboplastin or any substance that tends to increase coagulability may be used. A number of cases have been reported where human blood injections failed to check the bleeding, while an injection of thromboplastin was immediately successful, suggesting that the human blood did not furnish sufficient prothrombin. In an infant where cerebral hemorrhage has occurred spinal puncture is indicated if pressure symptoms exist. A number of cases have been reported where recompression has been performed.

The success of treatment is dependent chiefly on the early recognition of bleeding and the immediate injection of blood. It is as important to treat the cases of intracranial hemorrhage as those bleeding from a mucous surface. The delay is usually in the cerebral type. Given a newborn baby who nurses well for two or three days and then refuses to nurse, becomes pale and listless, with intermittent periods of crying spells followed by stupor and perhaps convulsions or twitchings of one or more muscle groups, an injection of blood or serum is indicated. A positive diagnosis may never be made if the infant lives, but often infants might be saved with this treatment.

Obscure bleeding and in most cases cerebral bleeding are undoubtedly more common than generally supposed. Weyhe found that twelve per cent. of 959 infants at necropsy showed evidence of cranial hemorrhage while Warwick's thirty-six necropsies revealed that fifty per cent. showed hemorrhages in the dura over the brain surface or in the ventricles. It is impossible to state how often cranial hemorrhage is a part of a hemorrhagic diatheses or is traumatic in origin. Autopsies reported from different observers, as well as a study of my thirty-four cases, show that though trauma may cause cerebral bleeding in the majority of cases the birth was a comparatively easy one for the infant. In nineteen of the thirty-four cases collected the labor was comparatively normal. Forceps were applied in nine cases, in two cases delivery was through Cæsarean operation, and in two cases a long labor was reported. There were two face presentations. Thirteen infants presented symptoms of cerebral bleeding and five of those were forceps cases. By cerebral symptoms is meant muscle twitchings or convulsions.

The outlook for recovery in this disease is fairly good if the proper treatment is employed. Recovery from the umbilical and seromucous type is permanent. These infants show no tendency to bleed again. The outlook in the cranial type of bleeding is less hopeful. Spastic diplegias and perhaps epilepsy may follow recovery. In these cases it is difficult to say how much damage has been done by an organized clot. A guarded prognosis must be made, especially when an infant had convulsions which are supposed to be due to hemorrhagic disease.

If there seems to be no definite relationship between hemorrhagic disease and unusual labor what can be done to prevent this disease? The suggestion that blood coagulation as a routine on the newborn infant has been made and is being carried out in one of the maternity services. The normal period for coagulability would be from three to ten minutes. In case of delayed coagulation some substance to increase blood coagulability might be injected. However, cases of hemorrhagic disease have been reported in which the coagulation time seemed normal and frequently with delayed coagulation no bleeding ensued. Whipple has shown that in different types of bleeding there is an excess of antithrombin and either a deficiency or almost absence of prothrombin. Assuming that there is a loss of prothrombinantithrombin balance, the injection of some coagulant would seem indicated. A case of hemorrhagic disease carefully studied by Gelston showed at the time of hemorrhage a practical lack of prothrombin. Within eight hours after the cessation of the hemorrhage, prothrombin was present in normal quantities. In these cases three injections of whole blood had been given. Whether the whole blood furnished the necessary prothrombin or merely stimulated the blood to reestablish the prothrombin-antithrombin balance is a matter of speculation.

With so little known about the exciting cause of this disease preventive measures must of necessity be uncertain. The hope of reducing the mortality and lessening the permanent damage rests in early recognition of this disease and intensive treatment. If there is a suspicion of bleeding, and there always should be if the baby on the second or third day shows the symptoms described, blood, serum or prothrombin should be injected. A spinal puncture should be made in the cerebral cases. The question of the etiology and pathology of hemorrhagic disease is still obscure. Considerable investigation and experimentation must be done.

CONCLUSIONS.

1. Hemorrhagic disease of the newborn occurs in one out of every hundred births.
2. Intracranial hemorrhage is frequently a local manifestation of a general condition and is not necessarily associated with trauma during parturition.
3. Hemorrhagic disease occurs in an easy labor as often as in a difficult one.
4. Injections of blood serum or prothrombin given early materially improve the chance for recovery.
5. The early use of spinal puncture with a hypodermic injection of serum in the suspected case of intracranial hemorrhage is advocated.

29 Buckingham Street.

The Cause of Whooping Cough

Stomach Lavage Used as a Therapeutic Measure

By T. PROCTOR HALL, M. D., Ph. D.,
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Whooping cough is in all cases serious and in some dangerous. The associated disturbance of the stomach is the chief source of danger. With a view to the relief of these stomach disorders I undertook stomach lavage in several cases, which was followed by great relief in each instance.

In all these cases there was found in the stomach washings a white tenacious mucoid mass, which curiosity led me one day to examine under the microscope. I found that it consisted principally of thin walled semimucilaginous threads, two to four microns in diameter, each divided into cells ten to fifty microns long, together with some round or oval sporelike bodies of the same diameter. Specimens of these were placed in various nutrient media and kept at ordinary room temperature. Most of them grew, slowly at first, and in seven to twelve days developed aerial spores which were white at first but gradually assumed a distinct blue green color due to the ripened spores. The general character of the plant, the size of the cells, the thickness of the cell walls, varied with the kind and the abundance of nutrition supplied; but in every case it was penicillium, a form of blue green mold which often occurs on fruit and vegetables.

Whether the bacillus found by Koplik is the cause of whooping cough is still an open question. Unfortunately the treatment based upon that assumption has not proved effective. It is therefore in order to inquire whether whooping cough may not be due to the presence of penicillium in the stomach. The cough is characteristically a stomach cough. When the spasms are severe, relief is not obtained till vomiting occurs.

In eight cases lavage of the stomach has cured the disease in from three to six days. The relief is immediate. After the first day's treatment the spasms lose most of their intensity, and if the treatment is begun early three days is sufficient to end the cough. Lavage is given twice a day, before meals. Diet is restricted to food that is quickly digested, excluding milk, though malted milk may be given with advantage.

During the past winter there have been a good many cases of socalled concealed whooping cough, namely, a persistent hoarse cough of a spasmodic character, but without the whoop. In six of these cases, penicillium was present in the stomach in moderate or small amounts, and they were cured in from one to three days by lavage. In one other case no penicillium was found; and in one other, which I failed to cure, another variety of penicillium was found in which the spores and the thread were one quarter the diameter of those found in the other cases.

For lavage I use two quarts of water, at a temperature of 100° F., containing twenty minims of lysol; and alternate this with water containing three or four drams of sodium bicarbonate. The distress caused by the treatment is less than is caused by a spasm of the cough; and is quite negligible after the third treatment. Turck's double stomach tube is advisable.

1301 Davis Street.

Some Diagnostic Points in Scarlet Fever*

An Analysis of Fifteen Hundred Cases of Scarlet Fever [1]

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New York.

This paper includes the results of my personal experience with one thousand five hundred cases of scarlet fever in the wards of the Willard Parker Hospital during the past three years. Inasmuch as the signs and symptoms of scarlet fever are so protean and varied in their character it is not my intention to emphasize the many better known diagnostic points of scarlet fever, but rather to devote the time didactically to the less well known signs. In so doing I will briefly touch upon certain points which are overlooked, not only on account of their evanescent character, but also on account of their relative unfamiliarity to the average practitioner, who is only seeing occasional cases of this disease. Incidentally, the majority of cases now seen run a very atypical course and are diagnosed with difficulty. Necessarily all of the signs cannot be emphasized in this study. Accordingly I have arbitrarily divided these signs into two groups, all of them subject to wide variations: first, the more common signs, and second, the special signs. These signs can be grouped under the heading of four stages. These are: 1, the preeruptive; 2, the eruptive; 3, the posteruptive, and 4, the stage of desquamation.

MORE COMMON SYMPTOMS.

Preeruptive stage:

a. Usually there is an epidemic in progress, or there has been exposure to an isolated case.

b. There is high fever, prostration, and thirst.

c. Angina is present, especially in the submaxillary, postcervical and inguinal regions.

d. The face is puffy and red.

e. There is a rapid pulse, of 100 to 140, which is markedly increased out of all proportion to the temperature.

f. The tongue is coated, and vomiting may or may not occur.

g. Headache and lassitude are usual symptoms.

h. Sore throat, or pain on swallowing, is very constant.

Eruptive stage:

a. Vomiting is present.

b. There is a high fever. (102 to 104° F.)

c. The pulse rate is markedly increased (120 to 140).

d. Angina is present. The tonsils are swollen (with yellowish exudate in the crypts).

e. Respirations are increased.

f. Strawberry tongue. This is dark red at tip, the redness gradually extending backwards with enlarged papillæ. This, however, is also seen in other conditions, such as measles and diphtheria.

g. There is an erythematous rash, punctate and dull reddish brown in color, appearing in twenty-four hours, on the forehead and back of the neck. The lesions are from one to three millimetres in diameter and are not elevated. The rash rapidly spreads down the trunk as far as the groin, with strips running down the inner side of the thigh, and backwards as far as the hips. It then finally spreads to the extremities, the dorsum of the hands, feet, fingers and toes especially being involved. The rash usually becomes confluent and does not appear to be made up of single puncta.

h. A delayed rash is not rare. Eight to ten days may elapse before its appearance. During this time the patient has all the other characteristic symptoms of scarlet fever.

Posteruptive stage:

a. There is a faded rash.

b. The tongue is glazed with the papillæ still enlarged.

c. The skin is dry and shrunken, a dirty brownish yellow in color, with a distinct pigmentation seen on pressure, not as intense, however, as it is in measles, or as long lasting.

d. There are sudamina, miliary vesicles, and pustules.

e. The angina is less and tenderness is absent.

f. All the subjective symptoms gradually clear up.

g. The temperature falls by lysis, a very characteristic point in the differential diagnosis of scarlet fever and measles.

Stage of desquamation:

a. There is exfoliation on the face, neck and chest.

b. There are complications in the kidneys, joints, heart, ears and glands.

c. Scaling on body. The character of the desquamation is typical. On the face there usually appears a fine dusty desquamation. On the neck, chest and trunk (middle of second week), the desquamation is flaky, and the skin sometimes peels in large strips (lamellar desquamation as opposed to the furfuraceous or branlike desquamation of measles). The palms of the hands and the soles of the feet are the last to be involved. The amount of desquamation normally bears a definite relationship to the severity of the antecedent rash.

d. The skin has a papery feel, and wrinkles, resembling the skin of a very old person.

SPECIAL SYMPTOMS SEEN BUT NOT ORDINARILY RECOGNIZED.

Preeruptive stage:

a. The mucous membrane of the cheek and gums are reddened and thickened.

b. The dorsum of tongue is dark red in color, and barely coated.

c. The paratonsillar lymph nodes (at angle of jaw) are enlarged and tender to the touch.

d. The mucous membrane of the soft palate and pharynx is markedly reddened, the redness being sharply bounded at the hard palate.

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*Read before the New York Academy of Medicine, Section on Pediatrics, March 9, 1922.

[1] From the Willard Parker Hospital.

e. The uvula may be red and edematous.

Eruptive stage:

a. There are fine puncta on tonsils and palate. The lips are much redder than usual.

b. The rash appears on the temple, the cheeks are profusely red, the discoloration being confluent, and spreading over the bridge of the nose; the tip of the nose, the upper lip and the chin are pale, presenting a triangular section of skin, the base downwards. This is called circumoral, or perioral pallor *and is very diagnostic.*

c. There is marked involvement of the flexor surfaces of the joints of the extremities, especially of the antecubital and popliteal spaces. There may be grooving, ecchymotic spots or small petechial hemorrhages, or a distinct blotching. With the exception of the joint surfaces there is little if any involvement of the surfaces of the upper extremities, from the middle of the upper arm to the lower part of the forearm.

d. An examination of the palms and soles with a magnifying glass shows no puncta, but does show a distinct erythematous blush.

e. The rash of scarlet fever is always generalized, and is never confined to one part of the body.

f. Pressure of the fingers on the skin will obliterate the rash. In some cases pressure, especially on the skin of the abdomen, will occasionally cause an anemia, greenish or icteric in color.

g. Scratching the skin with a fingernail will cause a red line, with an area of distinct pallor (*Raies blanches*) on either side. This is not seen in all cases. The (*tâche cérébral*) differs from this in that it has no area of pallor on either side. The *raies blanches* are of aid in diagnosis as evidence, not as proof, as similar skin reactions often follow diphtheria antitoxin, or other sera.

h. Scarlet fever is oftentimes hard to diagnose in negroes. A point to be remembered is that *strong* pressure on the skin, especially on the soft parts of the upper arm or abdomen, will sometimes reveal the typical scarlet rash in the pallor which results. The skin is also without the shininess seen in health, and is more intensely black.

i. Occasionally there appears small papules filled with serum or pus. They are sequels of the skin follicular swellings and are known as scarlatina miliaria. By some observers they are regarded as giving a favorable prognosis.

Posteruptive stage:

a. Purpura (simplex) is sometimes seen in the later stages of the disease, and is probably caused by sepsis.

b. Slight pressure sometimes will cause numerous small petechial hemorrhages. This is due to the fact that the blood vessel walls have become more friable. These hemorrhages are especially observed on such portions of the skin which are exposed to pressure (antecubital, popliteal, axillary spaces). Slight pressure by the fingers in such a spot as the skin of the chest anteriorly will produce them almost immediately. They, however, are not diagnostic of scarlet fever alone.

Stage of desquamation:

a. Pinholing. Large flakes of desquamation with a perforated centre determines this diagnostic point of dequamation. The bursting of an inflamed skin papilla causes a small breach in the skin, which at first small, increases in size, and soon becomes visible as a pinhole in the cuticle. This is best seen on the neck and the chest and the outer aspects of the upper extremities.

b. Peeling from the hands, feet, fingers and toes sometimes results in the epidermis coming off entirely in a cast, en masse. Finger desquamation is pathognomonic of scarlet fever. There is also a thickened parchmentlike feel of the balls of the fingers, followed by the white line at the juncture of the pulp of the fingers with the nail.

c. Involvement of the finger nails occurs usually from the sixth to the eighth week. It may be either a scaling or a cracking line extending up to the fingers, or a transverse linear groove and ridge in the roof of the nail. Both of these are particularly marked in the thumbs.

d. At the inception and during the stage of desquamation the tongue is dry, red and glistening after the lingual mucous membrane begins to exfoliate. This is called beefy tongue and is the earliest manifestation of desquamation, starting on the fourth or fifth day of the disease.

e. Where there is only a little desquamation, the heels, and the anterior surfaces of the fingers and toes usually show desquamation. This, or the development of a late nephritis may clinch a diagnosis in cases where the rash and other signs have been atypical.

f. Second desquamation is a rare feature of scarlet fever and may appear from two to six weeks after the first desquamation.

g. There is extreme sensitiveness of the skin to heat and cold. This is not usually described by the textbooks.

h. Desquamation in infants is sometimes powdery as in measles. It is also seen occasionally in older children at the anterior borders of the axillæ, at the lower part of the neck, and between the fingers and toes.

i. The hands and feet after desquamation are sometimes left soft, moist and clammy.

j. There appears, just before joint involvement, from five to thirty reddish brown spots on the flexor surface of the joint involved. These are prognostic of joint involvement.

BLOOD.

The blood examinations usually show a leucocytosis of 15,000 to 45,000, the increase being in the polymorphonuclear neutrophiles. This usually disappears about the end of the second week. The eosinophiles may sometimes be diminished, although this is not constant.

URINE.

The amount of urine varies with the stage of the disease, being diminished during the preeruptive and eruptive stages, and returning to normal during the posteruptive stage, and increasing almost to the point of polyuria during the stage of desquamation. Normally there may appear during the eruptive stage a small amount of albumen, a few casts, and red blood cells. This is the result of the high temperature and must not be confused with the post-scarlatinal nephritis which appears as a complication of the stage of desquamation. Albumen is present in seventy-five per cent. of all cases of scarlet fever, ranging from a very slight trace in forty per cent. to a large trace in five per cent. Real kidney involvement usually occurs from one to three weeks after the onset.

ANALYSIS OF 1,500 CASES.

Symptoms on admission in order of frequency.

Tongue	1753	Nasal discharge	69
Rash	1249	Circumoral pallor	68
Congested throat	1036	Otitis media	43
Tonsils enlarged and congested	348	Septic cases	34
Tonsillar exudate	333	Arthritis	32
Adenitis	259	Pneumonia	28
Heart murmur	134	Conjunctivitis	25
Pharyngitis	130	Croup	14

Symptoms and complications during course of disease in order of frequency

Adenitis	164	Arthritis	32
Otitis media	82	Koplik spots	30
Heart murmur	80	Measles	26
Rash	52	Severe coryza	20
Arrhythmia (heart)	43	Septic cases	20
Conjunctivitis	40	Edema (nephritis)	18
Pneumonia	37	Tonsils congested	12
Nasal discharge	33		

There were charted in one thousand five hundred cases eighty-two different symptoms on admission, with twenty-seven conditions not primarily caused by the scarlet fever. There were charted in these cases ninety-two various symptoms during the course of the disease, with nine other conditions not directly due to the scarlet fever.

The most common causes of death in one thousand five hundred cases of scarlet fever were: 1, toxemia; 2, cardiac involvement; 3, pulmonary involvement; 4, renal involvement; 5, otitis (mastoid). In making a diagnosis the two essential points to be considered are the characteristic throat, and the appearance of the tongue changes.

Relapses are unusual and occur in fever hospital wards where a constant addition of fresh cases keep the ward more or less surcharged with infection. We have observed this at the Willard-Parker Hospital as occurring generally during the fourth week, the symptoms being the same as the original attack. They are in all probability caused by incomplete elimination of the primary process.

I have seen one well authentic case of second attack in the past three years, occurring in an adult of twenty-five years.

It will be recognized from this enumeration of symptoms that oftentimes scarlet fever is an exceedingly difficult disease to diagnose.

For this reason some of the more common symptoms, and a number of those not generally recognized are here presented.

Medical Aspect of Carious Teeth in Infancy and Childhood

By JOSEPH MARCUS, M.D.,
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Pediatrist to Atlantic City Hospital; Jewish Seaside Home; Bamberger Home; Baby Welfare Clinic, and Physician to Children at Pine Rest Sanatorium.

Carious teeth is an important cause of ill health in children, the pernicious effects of which have only recently been appreciated. As to the frequency of dental caries among children of school age, the combined statistics of most observers in their routine examinations show that eighty to ninety per cent. of school children have decayed teeth. Childhood is the period of life at which growth and development, both mental and physical, are at their greatest activity, and in this period of childhood it is obviously essential that the tissues receive proper nourishment. Dental caries interferes with the proper assimilation of food, so making its occurrence at this period of life specially detrimental.

The hygienic rules indicated for the civilized adult applies as well to the child beyond the age of infancy. The regular care must commence with the deciduous teeth, because the health of the permanent teeth depends in a great measure on that of the temporary teeth. Furthermore, the deciduous tooth has a great deal of influence upon the direction of growth of the permanent tooth, and by extensive decay of those first teeth the permanent teeth are often injured.

Among the causes of dental caries the most important element is the lack of cleanliness, and the greatest danger to the teeth therefore arises from the food particles which cling to their surfaces, and which by fermentation gradually dissolve the inorganic substance of the tooth. There and then do the bacteria of decay and disease begin a successful work of destruction. The chief hygienic rule, then, is to remove all food particles after each meal. The proper usage of the tooth brush should be taught to the child as early as possible. The brush should be soft and should be moved in a vertical direction parallel to the interdental spaces; the transverse brushing of the teeth does more harm than good. The subsequent washing of the mouth should be done with a sucking movement in order that the water may be forcibly drawn between the teeth.

A common and important evil resulting from decayed teeth in children is disorders of digestion, which ultimately interfere with nutrition and growth. At this period of life it is far more important than in adult life to maintain a proper nutritional equation, for in childhood nourishment is required not only for the maintenance of structure already built, but also for the building of new tissue, and so failure of digestion means failure of properly continued body building. So it results that wasting is one of the most ordinary symptoms of digestive disorders in childhood, and this may be, and often is, dependent upon caries of the teeth which prevents the proper mastication of food. Some children inveterately bolt their food, but not always from sheer habit or stubbornness. The real reason may be caries and tenderness of the teeth, and the end results of swallowing the poorly masticated food may not be only the impairment of nutrition, but colicky abdominal pains as well. Failure of appetite is a common symptom of indigestion in childhood, and this is often brought about by carious teeth. Loss of appetite in children is a cause of great anxiety for the parents, and often presents a puzzling situation to the medical man by its obstinacy. There are many causes for it, and among them we must certainly reckon with dental caries.

Carious teeth are often associated with enlarged and sometimes with undoubtedly tuberculous glands of the neck. Tubercle bacilli have been demonstrated in the carious teeth, and it has been assumed that decayed teeth are a source of tuberculous infection of glands in the neck. The presence of carious teeth is a menace to the general health, and certainly predispose to local tuberculosis. Smale and Colyer quote that in the examination of over nine hundred children, seventy per cent. showed glandular enlargement, and more than half of these had carious teeth, whereas of nearly twenty-nine per cent. who had no glandular enlargement, only five showed caries of the teeth. However, it must be kept in mind that pharyngeal conditions, adenoid enlargement, and tonsillar diseases are probably responsible for much of the glandular enlargement.

As a result of the local irritation various nervous symptoms may arise, and it has been demonstrated that caries of the teeth is sometimes responsible for nervous manifestations such as habit spasm, facial chorea, headaches, and some mention epilepsy.

With regard to the causes of dental caries in childhood, there are several questions to be considered, among which the most important is no doubt, oral cleanliness. The diet and general health of the child also must not be overlooked in their relationship to causation. This neglect and improper use of the tooth brush lead to decomposition of food and secretions, acid fermentation, gingivitis, erosions of the enamel, etc. All cases of caries of the teeth cannot be attributed to this cause, however, and the important practical point of the direct or indirect effect of diet requires due consideration. That excessive indulgence in sweets is more or less responsible for caries of the teeth, is indeed well founded, and there is no doubt that the acid fermentation of the sugar has a destructive effect upon the enamel. Starchy foods, such as bread, biscuits, and potatoes, remain in the crevices within and between the teeth and may cause acid fermentation in prolonged contact with the teeth. Excess of starch and sugar and the ingestion of either between proper mealtimes are common sources of indigestion in children, and may thus favor, indirectly, the onset of dental caries. In cases of indigestion, the furred tongue, the heavy odor of the breath, the apthæ, all these are indications of an inviting nature, that must favor the growth of bacteria and the occurrence of acid fermentation which has a distinct tendency to erode the enamel. Hereditary lues is also a cause and in children with mental defects the teeth are very susceptible to early disease or decay.

The symptoms of dental caries are both local and constitutional. As a result of the decomposition and the ensuing infection there are present foul breath, alveolar abscess, gingivitis, aphthous or ulcerative stomatitis, and toothache. The lymph nodes in the vicinity become enlarged and may or may not suppurate. The general symptoms result in part from the improper mastication and subsequent digestion of the food, and also from the septic absorption. Among the more important of these constitutional symptoms may be mentioned failing nutrition, anemia, loss of appetite, and a slight fever, which may persist for many weeks. In the more severe cases evidences of sepsis may be quite obvious, such as high temperature, marked loss of weight, swelling of the joints. An acute rheumatic condition complicated by cardiac manifestations is not infrequently the result of sepsis directly traceable to dental caries, and no treatment has any significant influence on this condition until this local condition has been successfully treated. In the question of prevention and treatment we have heard a great deal of dental inspection in the schools and the need of dental supervision of school children, but we may emphasize the fact that the dental damage is present in a large proportion before the school age. Evidently the prevention of dental caries must date from the period of infancy, and the most important step in this direction is correct infant feeding. Moreover, any nutritional disturbance occurring during the second or third year of life has a tendency to influence the development of the primary or the permanent teeth and render them susceptible to decay.

Every mother should see that her child's teeth are cleaned morning and evening, starting from the time of their eruption; commencing at first with a soft rag and a mild alkaline solution, such as sodium bicarbonate, or borax, or a solution of prepared chalk, and later to teach the child the use of the tooth brush. As to the actual local treatment of the teeth, we are well aware that there are reasons which make it desirable not to remove primary teeth if this step can possibly be avoided, but taking into due consideration how much the child's health and nutrition are suffering at this important period of life, we must leave it to the dental expert to decide whether it is possible to save the tooth by filling it, or whether he can only get rid of the caries by extracting the tooth. If parents would take their children two or three times a year to a dentist in this early stage of life, the primary teeth could often be saved before the extent of caries makes this procedure impossible. There is an unfortunate impression, existing among the laity, that one can conscientiously disregard decay of the first teeth, whereas in reality, decayed teeth at this period of life exerts a much more harmful action than when occurring in later life; at this early time the nutrition of the child is more easily disturbed, and the disturbance means a greater amount of interference with the general development, enlargement of the glands is more likely to result from the irritation present, and in all probability disease in a temporary tooth will not only destroy the temporary tooth, but greatly enhances the occurrence of caries in the coming permanent tooth. The care of the mouth in children demands special attention during the course of diseases, particularly those of an infectious nature.

Acute Intestinal Obstruction Due to Appendicitis*

By HARRY APFEL, M. D.,
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I am prompted to report this case because its apparently mild symptoms masked an acute abdominal condition in a child two years of age who had never been ill before.

Case.—The patient, a boy two years old, was referred to my service at the Brownsville and East New York Hospital, on March 12, 1922, by Dr. H. Plotkin, with the following history: A full term normal delivery, first born, breast fed up to the end of the first year. He had never been ill up to six days prior to admission to the hospital. The illness commenced with vomiting, fever and restlessness. Enemas and cathartics were administered without number and with no effect. He had had no bowel movement since the day he took sick. The vomitus was composed of milk curds and bile. On being questioned, the mother said that the vomitus did have a fecal odor several times. There was no blood passed by rectum at any time during the illness.

Examination on admission showed a child about two years of age, lying quietly and somewhat listlessly. The respiratory movements were regular and not labored, cardiac impulse was visible, and color of the skin good. The head was well formed; fontanelles closed, hair well kept. The ears and nose were negative, eyes clear, pupils reacted normally, no adenopathy present. There was no opisthotonus and no impediment in motion of the head. An examination of the mouth showed the teeth to be in good condition, tongue coated in the centre, with papillæ prominent at the base, a characteristic of very acute illness. No Koplik's spots were noticed. Throat was negative and heart and lungs were negative. The abdomen was well rounded and distended, distention somewhat more marked in the lower quadrant near the median line on the right side. On palpation it was quite easy to rule out any enlargement of the spleen or liver, in spite of the distention. There was no evidence of any tumor, sausageshaped or otherwise, but the surface over the right rectus muscle seemed to offer more resistance than the left side (this could only be made out on very gentle palpation), otherwise no rigidity in any part of the abdomen. The child did not seem to manifest evidence of pain at any time during the examination. The respiration rate was 24 a minute; pulse rate, 104 a minute; temperature (rectal), 99° F. Laboratory findings: Urine, negative for albumin, casts or sugar; specific gravity, 1.020; red blood cells, 3,100,000; white blood cells, 13,200; polymorphonuclears, seventy-three per cent.; small lymphocytes, twenty-seven per cent.; hemoglobin (Sahli), fifty-five per cent. The case presented a problem for an immediate diagnosis.

The question naturally arose, is this an acute abdominal condition and as such must have immediate surgical treatment, or are these abdominal symptoms merely complications and secondary to an acute condition elsewhere in the body. Meningeal involvement and any affection of the thoracic were ruled out.

This narrowed the problem down to a pathological condition in the abdomen. While it is not always practicable nor possible to attempt to make a pathological diagnosis in such cases, nevertheless it should be attempted previous to turning the patient over to the surgeon for operation. It was with that principle in mind that the various abdominal possibilities had to be analyzed, in order, if possible, to narrow the diagnosis down to one of two or three conditions in order to become thoroughly convinced that the case was one that required immediate surgical intervention.

The following therefore came up for consideration: Acute intestinal obstruction due to the following conditions: 1, intussusception; 2, fecal impaction; 3, various forms of hernia; 4, acute appendicitis; 5, congenital tumor, or new growths; 6, tuberculosis of mesenteric lymph modes; 7, chronic appendicitis with adhesions; 8, Hirschsprung's disease.

Intussusception was ruled out because of the duration of the illness and the absence of bloody stool, negative rectal examination and finally by the comparatively good general condition of the patient considering the duration of the child's illness—six days. Chronic appendicitis resulting in adhesions, which might have brought about such picture was ruled out by a negative previous history. For similar reasons tuberculosis and Hirschsprung's disease were excluded. Acute appendicitis, we know, is the most frequent condition met with in cases presenting acute conditions in the abdomen, but this view was more or less clouded by the element of complete obstruction that this case presented from the beginning of the illness. While constipation is a frequent symptom in acute appendicitis, complete obstruction, after cathartics and enemas have been administered, is rare. From the physical findings the evidence was more in favor of a new growth than of an acute appendix.

TREATMENT.

Having considered all the facts given above it was concluded that the case was one of acute abdominal disease regardless of the exact nature of the existing and temporarily obscure pathology, and the treatment that naturally suggested itself was immediate operation, with orders for a single high enema of soap suds and glycerine to be given soon. The enema was ineffectual, the water returned as injected. The surgeon, Dr. J. Tenopye, agreed as to the treatment suggested—immediate operation. On opening the abdomen free fluid was found in the abdominal cavity with extensive adhesions and a foul and gangrenous appendix adherent retrocecal. The appendix was removed, drainage was instituted, and the child made a protracted but complete recovery.

182 New York Avenue.

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*Read before the Brooklyn Pediatric Society, May 17, 1922.

Editorial Articles

SCHOOL HEALTH SUPERVISION.

The Bureau of Child Hygiene of the New York City Department of Health made in 1909 a study of 356,299 children to determine at what age physical defects may be found for the first time; how many physical examinations are necessary during the school life of the child; and when physical examinations are most necessary in relation to the age of the child. In 1921 a similar study was made of 139,770 children of the same age groups in order to determine the different conditions, if any, existing at the later period, and whether or not war conditions had caused any alteration, in either sex or age incidence, of the physical defects in question. The detailed results of both studies are given in an article in the June number of the *American Journal of Public Health* by Dr. S. Josephine Baker, director of the bureau. Dr. Baker established this bureau in 1908, the first bureau of child hygiene in America. At that time the infant death rate in New York city was 144 under one year of age to 1,000 births. In 1921 it was 71.1 to 1,000 births, amounting to a total saving of 82,549 lives, had the death rate of 1908 continued. An interesting result of Dr. Baker's work is shown in the fact that infant death rates in the most congested and the foreign districts of the city are lower than those in the expensive residence sections; for it is the foreign born population that has been willing and anxious to learn and profit from Dr. Baker's corps of more than five hundred nurses and specialists in the sixty-eight baby health stations and prenatal clinics of New York.

It may be interesting to note in brief some of the results of the above mentioned studies of physical defects in school children. The less common and more chronic defects, such as pulmonary, cardiac and nervous disease, were found to remain at about the same level throughout school life, and to be apparently little, if at all, influenced by school environment. Defective hearing showed a relatively small increase, and defective vision a marked increase, both steady and persistent, from the entering to the leaving age throughout the school life of the child. Malnutrition, defective nasal breathing, implying adenoids, hypertrophied or diseased tonsils, and defective teeth showed their highest incidence, either at the age of entering or at the eight to ten year period, presenting thereafter a fairly persistent and regular decline. While the incidence of physical defects in all age groups was found to be lower in 1921 than in 1909, the relative age incidence remained the same, the percentage of defects at each age bearing about the same relative position in both studies. Although physical examinations and follow up work for school children between 1909 and 1921 have evidently reduced the total of physical defects, with a resultant raising of the health standards of those examined, they have not, however, resulted in a change of the relative age ratio of the physical defects discovered.

The principal conclusions are as follows: "This study would seem to show that the expenditure of time and money to make annual physical examinations of school children is not warranted and seems to be unnecessary. Analysis of the age and sex incidence of physical defects in this study shows that proper and adequate physical examinations made in the early life of the school child—that is, before the eight to ten year period—are essential, and if these are properly followed up and suitable treatment obtained, the appropriation for this work will be spent in the most economical way, the child's health will be more thoroughly protected, and future disease and the sequelæ of physical defects be more adequately guarded against than by any of the present methods of school health supervision."

THE REPREHENSIBLE TONSIL.

The tonsils have been accused of many crimes and frequently found guilty. Severe infections have found an entrance through the tonsils and fatal toxic states and critical cardiac conditions have resulted. These facts have been carefully worked out by able clinicians and while it may be difficult to produce absolute proof, it is a bit dangerous to try to disprove them. So much for pathological considerations.

Less concern has been given to the functional or physiological importance of tonsils. It has been conceded that they must serve some purpose, however trivial it may be, but the general attitude has been that these organs are archaic vestiges analogous to the vermiform appendix. Such an analogy leads to a consideration of the compensatory rôle played between appendix and tonsils. It has been noted with great frequency that in the case of the removal of the appendix the tonsils attempt to take over the protective function of the appendix. The same seems to hold when tonsil removal has been effected, for then the appendix becomes a source of irritation or even inflammation and ulceration. These are only hypothetical observations and should be confirmed by further investigations.

For the moment we will set aside these considerations and refer briefly to a paper in this issue of the JOURNAL by Blauner and Orgel in which they present an extremely important series of observations on tonsillar operations, showing that in many instances these operations have not proved the panacea it was hoped they would.

It is hardly fair to remove organs as important as the tonsils may be, and of which we know so little, for we do not really know the extent of their usefulness, simply because they were apparently the source of infection in certain cases. A careful reading of the paper referred to should cause us to study more extensively the normal functions of the tonsils. They should be removed only after being examined carefully by a competent observer and found to be diseased to a degree which gives rise to a systemic infection. In many cases tonsils have been removed which could have been cured and allowed to remain to serve the purpose for which they were intended.

Another most important point brought out by Blauner and Orgel's interesting study is the latitude which nonmedical observers of school children are given in deciding on serious medical subjects, such as the necessity for the removal of tonsils. There is something radically wrong in a system which allows a freedom of this character. The paper demands careful consideration and study.

ARTHRITIC DEBILITY IN CHILDHOOD.

Arthritism is a deviation of the metabolism transmitted through generations, especially in the families of the well to do, and it is highly important for the practitioner to detect this organic deviation in early infancy. Arthritism is a grouping of various equivalents, namely, seborrhea, eczema, asthma, corpulency, diabetes, gout, hepatic and renal calculi, hemorrhoids, migraine, bronchorrhea and nasal hydrorrhea, which may replace one another or be combined in successive generations or during the life of an individual.

The evolution of this diathesis may be likened to a ribbon which unrolls from birth until old age, with variegated colors and shades. Eczema and seborrhea are present in infancy, asthma in childhood, obesity in adolescence, migraine, hemorrhoids, nephritic and hepatic calculi, gout and diabetes in adults, and chronic deforming rheumatism in advanced age. Arthritism is a product of heredity but the arthritic will not necessarily manifest the same equivalents as his parents. In the child of an eczematous father gout may develop, so that there is a mutability of equivalents during the hereditary series and during the evolution of the subject.

It seems probable that there is not a simple predisposition and a child being submitted to the same life as its parents—overeating, sedentary life, etc.—will manifest the same affections as the latter. Régime may, to a certain extent, attenuate the hereditary manifestations, but will not prevent their occurrence sooner or later. The hereditary taint makes itself progressively evident, but the slowness of its appearance and its decline—should conditions of life bring this about—is one of the characteristics of arthritism.

But beside the slowly developing arthritism, there is another type which proceeds by leaps and bounds. Thus, a first generation tainted with slight arthritism may give issue to a generation whose deviation may be brusquely intense, while, on the contrary, the inverse is never observed, and an important point is that marriage between arthritic subjects increases the deviation in the offspring.

A factor always to be reckoned with is the vasomotor congestive element which, on account of its sudden development, may explain a good number of arthritic manifestations. Alimentary anaphylaxis is one of the fundamental characters in arthritic subjects who suffer from hypersensibility in respect to certain foods. The arthritic subject spends his reserves quickly and hence it is that these children grow with little food intake, but their limit of tolerance to superalimentation is low. Nutrition must be accomplished slowly and by degrees, because the slightest upset will result in an outburst of arthritism.

The circulation in this diathesis is sluggish and the subject usually suffers from cold extremities which are often cyanosed. The daily amount of urine voided is often far below the average quantity, although there is no clinical reason for this, and from time to time attacks of polyuria occur.

The arthritic child is usually lusty and of flourishing appearance, this being due to the development of the subcutaneous fat, the retention of water, or to both of these elements combined. Successions of corpulency and flaccidity are characteristic of water retention. Sometimes there are crises of edema occasionally accompanied by colic or vomiting without any evident cause, whose duration is variable and they often subside after a renal or intestinal crisis. Some infants seem to present retention of water *in utero,* losing more than normal weight after birth. These edemas are by some supposed to be due to the nervous system and heredity, such as acute angioneurotic edema or familial angioneurosis. Instead of being general, the edema may be localized to the limbs, face or eyelids and is not due to a renal lesion and there is no chloride retention. Lactose, as well as an absolute milk diet, does not increase the output of urine and has no action on the edema. The really proper treatment is the ingestion of hot drinks and discarding every form of milk diet. The urine will then increase, the edema will subside and the child's weight will decrease.

Arthritism is not always florid and may suddenly result in physical or mental debility—dementia præcox, insanity, etc. Hence variability, instability, mutability, and susceptibility are the symptoms of arthritic deviation of metabolism.

FATALITY FROM COLD DRINKS.

Medical men have their folklore, as have the people at large. Mistaken ideas, sanctioned by time, die hard, even among socalled men of science. In the differentiation of diseases and the sorting of causes and effects it is little wonder that there should have arisen confusion of ideas that, to a degree, still persist.

There is a general belief that it is highly dangerous to drink cold water in warm weather when we are very warm, and in a much recommended book on dietetics of the present century the warning against this practice is down in black and white. If we trace this teaching to its origin, we find that the fatalities that occurred from this practice always happened when the temperature of the air was eighty-five degrees or upward. The symptoms described are those of sunstroke or heat exhaustion, and the clinicians of the day had confused, or rather, not yet differentiated, the effects of heat suppression and the very different experience of giving the interior of the stomach a cold bath.

So strong was the belief that the taking of a cold drink, and not the inability to get rid of heat, was the cause of those pathological catastrophes of hot weather, that in one of our largest cities, a century since, the Humane Society placed printed posters on the public pumps, warning the hot and thirsty to pause before imbibing and hold the cup in the hands until some of the dangerous cold was extracted from the water. Very different from what a humane society might be doing in this day.

While sudden deaths in hot weather were not so easily attributable to a plunge into cold water, this performance was, and is still considered highly dangerous, perhaps because of the supposed connection between death and the drinking of cold water.

That disabling cramps should follow a strong swim when one has been much fatigued before entering the water, has good ground. Cramps of the muscles are not at all uncommon in factory workers and stokers exposed to high temperatures, especially if humidity is combined with the heat. Experiments of Lee and Scott have shown that the muscles of animals exposed to high temperatures are in a condition of fatigue, and have neither the strength nor endurance of muscle in animals at ordinary temperature. Just what takes place in the muscles of the superheated or in muscles fatigued by work we do not know, though there is a chemical change somewhere in the organ. It is only a step from a condition of fatigue to one of tetanic contraction, so that the already heated muscles of a swimmer (it takes time to restore such a muscle to normal, even in cold water) may, if used with the vigor required for swimming, result in muscle spasms which render the swimmer helpless.

SINS AND SORROWS.

In an address on the Sins and Sorrows of the Colon, Dr. A. F. Hurst, in the *British Medical Journal* of June 17th, remarks: "The sins of the colon are its diseases. But I sometimes wonder whether it is not more sinned against than sinning, for whether with attacks from above with purges, attacks from below with douches, and frontal attacks by the surgeon, the sorrows are numerous and real." The paper is as meaty as it is refreshingly written.

Of the use and abuse of purgatives he says: "If the fortunes made from purgative pills had been devoted to the hospitals which treat the victims of their abuse, the financial problem of the voluntary hospitals would have been solved. About ten million pounds were expended in 1921 on patent medicines, the majority of which contained purgatives." This estimate must be conservative, as one popular laxative for children is costing the fathers and mothers in the United States $1,500,000 yearly.

"On several occasions," he continued, "when I have been asked to decide whether the operation of colectomy, which had been recommended for 'intestinal stasis,' should be performed, I have found that all the symptoms disappeared on giving up purgatives and adopting some rational treatment. It is sad that the description Gulliver gave the Houyhnhnms of the habits of his fellow countrymen is as true today as it was in 1727: 'They take in at the orifice above a medicine, equally annoying and disgusting to the bowels, which relaxing the belly drives down all before it; and this they call a *purge.*' I do not say that an aperient should never be used, but when required, one should be chosen, and a dose should be found which results in the passage of a single formed stool each morning. . . .

"Pliny tells how Egyptians learnt to wash out their bowels from observing the habits of the ibis: 'He washes the inside of his body by introducing water with his beak into the channel, by which our health demands that the residue of our food should leave.' It is cruel to deprive the ibis of his claim to this epoch making discovery, but the truth must be told: the ibis does not give himself a douche, but after washing his beak in water he oils it in his preen gland, which is situated near the anus, in preparation for preening his feathers.

"In the seventeenth century the enema reached the height of its popularity. It is recorded that Louis XIV received several thousand intestinal douches in the course of his life, and that the pious Duchess of Alva treated her sorely ill son with enemas of an emulsion of religious relics. Unhappily they failed to save him.

"The last twenty years have seen a remarkable revival in the popularity of the intestinal douche, a popularity which has led at times to its indiscriminate use for conditions in which it was not suitable. It is a valuable remedy, but its precise indications require to be defined."

He calls attention to the fact that a rectal tube cannot be passed more than four and a half inches beyond the anus. "The tube should be introduced not more than two inches. The fluid should be run in slowly at a pressure not exceeding twelve inches of water, and not more than a pint and a half of water should be used. . . . The enema introduced in this manner invariably reaches the caecum, whatever position is assumed by the patient, unless organic obstruction is present. I believe that de Graaf was correct when he wrote in his monograph, *de Clysteribus,* in 1668, that the usual ritual of lying in a series of positions has not the slightest effect." The whole article deserves careful perusal.

ANTIVIVISECTION.

The Heart of the Antivivisectionist is the title of a little pamphlet recently published by the Colorado Association for the Protection of Public Health. Dr. C. S. Bluemel is the author. The publication makes a justifiable plea for the recognition of the great and valuable part played by animal research in benefitting the human race. Unfortunately, this plea seems planned to appeal to the uneducated or the unintelligent person rather than to the reader seriously interested in the problem. The same type of argument is frequently used as the rabid "anti" is credited with using. To quote: "For, after all, an antivivisectionist would not choose to die when a guineapig could be made to die instead. And there would be no saving of lower life by such a sacrifice, for in digging the antivivisectionist's grave, scores of earthworms would be done to death." Perhaps this is a joke, but it is a poor one; and if it is an argument, it could not possibly have the least significance to a person of any intelligence. No man is such a fool as to advocate that, because he does not approve of experimenting upon dogs or horses, he will not kill a worm, or a maneating tiger, or a mosquito. Nor has anyone the right to argue that, because the premise may be true, the conclusion is inevitable.

Another point made much of is that "man is monarch of all he surveys." To illustrate, this quotation from Cardinal Dougherty: "According to the laws of nature, the lower species of creatures exist for the higher. . . . The brute animal and all other inferior things are for the good of man, who was made directly for the glory of God. Man, then, may use all inferior things for his own benefit." In another place: "It is therefore clear that lower forms of life must be destroyed in order that human life may be possible and tolerable. . . . Man is enjoined to do these things in the Bible, which in its first chapter bids him subdue the earth and have dominion over every living thing." Strange arguments, these, to flow from the pen of a man of science!

The real truth probably is that, except in the case of the most rabid fanatics, ignorance of facts is responsible for most of the feeling against laboratory use of animals and human subjects for experiments in medical science. And is not the physician responsible in part for this lack of knowledge? This is just what makes Dr. Bluemel's pamphlet valuable. It supplies in popular form this much needed information. Vivid descriptions are given of the hopelessly horrible conditions prevailing before the uses of serology, vaccination, antisepsis, preventive drugs and other forms of sanitation and treatment, all largely dependent as to the discovery of their uses and value upon animal research. This is shown to be as a rule not painful at present to the subjects, owing to the use of chloroform and ether. The probably necessary suffering of the old days before anesthesia was known is now over for both man and beast.

An argument not mentioned by Dr. Bluemel, and perhaps the most convincing of all in favor of animal experimentation, is the result of an inquiry recently sent by the Blue Cross, which is for animals what the Red Cross is to humans, to all laboratories and medical colleges in the country practising this form of research work. In every instance the replies received affirmed that all experiments performed on animals are conducted under the provisions of the

1909 Code of Regulations, with every care for anesthesia and asepsis that is observed in treating human beings.

Undoubtedly it is true that fanatical antivivisectionists have not hesitated to misquote, to use false arguments, to lie, and even to "fake" exhibits in their zeal to "prove" their points; but all those who have been interested in this side of the question have by no means been liars, nor perverse agitators, bent on deceiving the public, nor mistaken zealots, nor even ignoramuses. Dr. Bluemel's plea would have gained in force had he been content to emphasize the educational side of his presentation, rather than vituperate so bitterly his antagonists. One wonders how he happened to forget the well known Freudian consignment of all the antivivisectionists to the limbo of the sadists!

NEW HOOKWORM TREATMENT.

The United States Department of Agriculture has recently released for publication the information that, according to reports from the Fiji Islands and Ceylon, carbon tetrachloride, a cheap and common chemical, is a cure for hookworm in human beings. These reports cover thousands of cases and show practically one hundred per cent. of successes. The discovery of the efficacy of the drug was made by Dr. Maurice C. Hall, of the Department of Agriculture, who tested it on dogs and even on himself. Carbon tetrachloride is usually given in capsules and so far has apparently had no ill effects, nor does it seem to inconvenience seriously the person taking it in any way. It seems to be far superior to the old remedies, thymol and oil of chenopodium, both of which have caused fatalities. Dr. Hall found that a very small dose, 0.3 c. c. to a kilogram of live weight, amounting to less than an ordinary teaspoonful for a twenty-two pound dog, was effective. In another case a dog was given twenty fluid ounces, nearly half a pint, without apparent bad effects. Relatively heavy doses given to monkeys produced no poison symptoms nor any noticeable change in any of the organs. Twelve thousand natives of the Fiji Islands have been successfully treated by this method, a single dose removing all the parasites from ninety per cent. of the patients, and at least ninety-eight per cent. of the parasites from all persons treated. In the prison at Kandy, Ceylon, where hookworm is prevalent, the carbon compound was tried on fourteen prisoners with success. A condemned criminal offered himself as a subject for a thorough test, and was given a dose of ten cubic centimetres. Fifty-five hookworms were removed. After he was executed about two weeks later, a postmortem showed that all the parasites had been removed. Other convicts were apparently completely freed of the disease by much smaller amounts. No effects other than slight dizziness and a sensation of weight in the stomach occurred in patients receiving less than ten cubic centimetres. Carbon tetrachloride will doubtless prove a cheap, agreeable and effective treatment for hookworm.

News Items.

Typhoid Fever in Pennsylvania.—There were 207 cases of typhoid fever in the State in June as compared to 165 in June of last year and 164 in June, 1920.

Cancer Week.—The executive committee of the American Society for the Control of Cancer has fixed November 12th to 18th as the date for the next national cancer week. It will be conducted by the society's state and local committees in cooperation with volunteer and official agencies.

X Ray Laboratories to Be Lead Lined.—One of the most important regulations of the new x ray law concerns the protection of rooms adjoining x ray laboratories. It is required that the walls and ceiling of the x ray laboratories be lined with lead. Metal screens and filters for the protection of patients and operators are also required.

Directory of City Health Officers.—The 1922 directory of city health officers is published in the July 7th issue of *Public Health Reports* and may be obtained in reprint form. These directories of the health officers in cities of the United States having a population of 10,000 or more, have been published in *Public Health Reports* since 1916, and are compiled from data furnished by health officers.

Private Pavilion for Bronx Maternity Hospital.—The Bronx Maternity Hospital, situated at 166th Street and the Grand Concourse, has decided to build a five story annex to be used as a private pavilion. The annex will contain about fifty beds. This will enable the hospital, which was opened two years ago, to use its present quarters exclusively for charitable work, thereby increasing its present facilities for this class of work.

Rhode Island Medical Society.—The annual meeting of this society was held in Providence, June 1st, with President Dr. George S. Mathews, of Providence, in the chair. Officers for the coming year are as follows: President, Dr. Frank E. Peckham, of Providence; first vice-president, Dr. Arthur T. Jones, of Providence; second vice-president, Dr. William F. Barry, of Woonsocket; treasurer, Dr. Winthrop A. Risk, of Providence, and secretary, Dr. James W. Leech, of Providence.

Decline in Death Rate.—According to *Public Health Reports,* July 7, 1922, the gross death rate from all causes in the original registration states declined from 17.2 in 1,000 in 1900 to 15.6 in 1910 and 13.9 in 1920, a decrease of 9.3 per cent. in the first decade and 10.9 per cent. in the second decade. If the secondary but severe epidemic of influenza pneumonia, which occurred in the early part of 1920, is taken into consideration, the indicated decline from 1910 to 1920 is less than it would have been had 1920 been a normal year. In forty-two cities in the United States having a population of over one hundred thousand, the excess death rate during the 1920 epidemic period from influenza pneumonia alone was about 1.13 in 1,000. If the same excess may be presumed to have occurred in these original registration states, the death rate in 1920 would have been approximately 12.8 in 1,000, and the decline from 1910 would have been about eighteen per cent.

Resolution on Death of Dr. Lynah.—At a regular meeting of the Medical Board of Riverside Hospital, held on June 27, 1922, the following resolution was adopted:

Whereas, Dr. Henry Lowndes Lynah has completed his brilliant career as laryngologist at Riverside Hospital, we are moved to express our sense of profound loss of his fellowship and of admiration for the daring and skillful work which he undertook for our pateints. His reputation, won to some extent by work performed at Riverside Hospital, reflected merit on this Medical Board; therefore be it

Resolved, That a copy of these resolutions be spread on the minutes and a copy published in the medical press, and that a copy be sent, as a token of our sympathy, to the members of Dr. Lynah's family.

Dr. Walter A. Dunckel.
Dr. Jesse G. M. Bullowa.
Dr. George D. Wolf.

Economic Aspect of Defective Eyesight.—The Eyesight Conservation Council of America states that in an examination of more than ten thousand employees in factories and commercial houses, fifty-three per cent. were found with uncorrected faulty vision, thirteen per cent. had defects which were corrected, making a total of sixty-six per cent. with defective eyes. In one manufacturing establishment over seventy per cent. were found with eye defects. In another plant the following startling condition was discovered: Glasses worn and satisfactory, 8+ per cent.; glasses needed and ordered, 83+ per cent.; no glasses needed, 8+ per cent. As an example of inefficiency and resulting waste, twenty per cent. of the inspectors in a large factory were found to be unable to see sufficiently well to detect defects in the product they were inspecting. There are forty-two million gainfully employed in the United States, and over twenty-five million are handicapped by defective vision or eyestrain.

Course in Eyesight Conservation at Columbia University.—The first training course for teachers in eyesight conservation ever given under the auspices of an American university is being given at Columbia University. A feature of the course is the observation class, composed of children from New York city schools, whose defects of vision have placed them in the sight saving classes. Miss Gertrude Thompson, research agent of the department of sight saving in the public schools of Cleveland, Ohio, who is conducting the observation class, demonstrates the best methods of safeguarding the child with defective sight in every phase of its school work. The classroom demonstrations are supplemented by lectures given by Miss Thompson; Dr. Robert B. Irwin, Director of the Sight Saving Department of the public schools of Cleveland, and Mrs. Hathaway, of the Society for the Prevention of Blindness. Dr. Irwin, who is general director of the Columbia course, is supervisor of classes for the blind as well as the sight saving classes of Cleveland, Ohio. He is himself blind. A committee composed of representatives from city, state and national organizations, which is cooperating with Columbia, is headed by Dr. Thomas J. Riley, of the Brooklyn Bureau of Charities, and Miss Frances Moscrip, director of the classes for the conservation of vision in New York.

Instruction in Heliotherapy.—In order to acquaint physicians with the nature of this branch of therapy and its technic, Dr. Rollier and his colleagues at Leysin, Switzerland, instituted in 1921 a short course of lectures and demonstrations. This course will be repeated on August 15, 1922, and is free to the medical profession. The program is as follows: The scientific fundamentals of heliotherapy and the physical and biological study of light, by Dr. A. Rosselet; present conception of tuberculosis, by Dr. Lichtenbaum; the practice of the sun cure for tuberculosis and its clinical results—Pott's disease, coxalgia, arthritis, adenitis, by Dr. A. Rollier; the x ray diagnosis of osteoarticular tuberculosis and the radiographic control of the clinical results of heliotherapy, by Dr. H. J. Schmidt; the cork cure and the future of convalescents from surgical tuberculosis and preventive heliotherapy, by Dr. Rollier; the adjuvants of heliotherapy, heliotherapy for nontuberculous affections, and orthopedic apparatus used in heliotherapy, by Dr. Amstad; heliotherapy and the skin, by Dr. Teuba. The lectures will be followed by a visit to the thirty-four heliotherapeutic establishments of Dr. Rollier and to other places of interest in the vicinity.

Personal.—Dr. George Schwartz, of 417 Riverside Drive, has been appointed surgeon in chief of the Child Welfare Board. The appointment was approved by Dr. Royal S. Copeland, commissioner of health. Dr. Schwartz will look after the interests of nine thousand widows and thirty thousand orphans who come under the jurisdiction of the Child Welfare Board.

Dr. Ernest Yarrow, of Binghamton, N. Y., has been awarded by the Persian Government its highest award, the Star of the Order of the Sun and the Lion, in recognition of the relief work in Northern Persia done under Dr. Yarrow's direction during the last two years.

Dr. Leon L. Solomon, of New Orleans, announces that he will give the sum of $500 annually to the University of Louisville for use in the medical research laboratory. This will be known as the Solomon Fund.

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Died.

Armstrong.—In Denver, Colo., on Monday, July 3rd, Dr. Edmund James Armstrong, aged seventy years.

Bertillon.—In Paris, on Friday, July 7th, Dr. Jacques Bertillon, aged seventy years.

Bermingham.—In New York, on Saturday, July 15th, Dr. Edward John Bermingham, aged sixty-nine years.

Blake.—In Lisbon, N. H., on Tuesday, July 18th, Dr. James Eddy Blake, aged forty-nine years.

Campbell.—In New York, on Tuesday, July 11th, Dr. Annie Smith Campbell.

Groff.—In Philadelphia, on Monday, July 3rd, Dr. Charles A. Groff, aged seventy-five years.

Maroney.—In New York, on Monday, July 10th, Dr. William John Maroney, aged fifty years.

Miller.—In Pottsville, Pa., on Monday, July 24th, Dr. Charles D. Miller, aged sixty-one years.

Pettit.—In Norfolk, Va., on Wednesday, June 21st, Dr. Gaylord Joel Pettit.

Rice.—In Haverhill, Mass., on Sunday, July 9th, Dr. Robert Rice, aged fifty-two years.

Simpson.—In Howard, R. I., on Sunday, July 9th, Dr. George Eaton Simpson, aged forty-one years.

Youngling.—In New York, on Monday, July 24th, Dr. George S. Youngling, aged sixty years.

Book Reviews

NUTRITION OF CHILDREN.

Food, Health, and Growth. A Discussion of the Nutrition of Children. By L. Emmett Holt, M. D., LL. D., President, Child Health Organization: Formerly Professor of Diseases of Children in the College of Physicians and Surgeons, Columbia University. New York: Macmillan & Co., 1922.

One of the simplest and most readable books on nutrition written. The entire question is presented with lucidity and yet without making food the most essential thing in the world. The book is made up from a series of lectures delivered by Dr. Holt at the medical school of Leland Stanford Junior University. Many subjects are covered in an interesting fashion. The author modestly states that it is not to be taken as a textbook, yet it is of more value to the practitioner than most textbooks that have been written on the subject.

DISEASES OF CHILDREN.

Diseases of Infancy and Childhood. Their Dietetic, Hygienic and Medical Treatment. A Textbook Designed for Practitioners and Students in Medicine. By Louis Fischer, M. D. Ninth Revised Edition. Vol. I: Infant Feeding and Organic Diseases. Vol. II: Infectious Diseases—Cerebral—Orthopedic, and Eye, Ear, Skin, etc. With One Hundred and Forty-seven Text Illustrations, Several in Colors, and Forty-three Full Page Half Tone and Color Plates. Philadelphia: F. A. Davis Company, 1922.

Fischer's revised ninth edition appears in two volumes. A goodly space is devoted to normal physiological processes. The feeding question is handled in a broad understanding way so that the principles may be grasped with ease. Röntgenology as an aid to diagnoses is described and the illustrations are excellent. A most interesting topic well handled is that of transfusion in marasmic infants. The form and contents of these two volumes are all that can be desired.

FOOD AND VITAMINES.

Vitamines and the Choice of Food. By Violet G. Plimmer, Associate of the Royal Sanitary Institute, and R. H. A. Plimmer, Professor of Chemistry in the University of London at St. Thomas's Hospital Medical School. Illustrated. London and New York: Longmans, Green & Co., 1922. Pp. 164.

The authors state that the writing of this book followed the giving of special lectures on the subject of vitamines, which brought forth many requests for a written account suitable for the general reader. Their particular purpose is to serve and assist those responsible for the feeding of infants and for the selection of food in schools and "other large communities."

The accessory food factors (vitamines) have a special significance as marking the entry of biochemistry into problems of health and growth. A fact of great interest very recently announced by the daily press is the discovery by Dr. E. V. McCollum, of the School of Hygiene and Public Health of Johns Hopkins University, assisted by Miss Nina Simmonds and Dr. P. G. Shipley, of a hitherto unknown fourth vitamine, protecting bone growth, which has been named Vitamine D. It is also significant that both England and the United States have produced almost contemporaneously standard works for general reading on the subject of vitamines. The American work referred to is entitled *The Vitamines,* and was written by Professor Sherman, of Columbia University, and S. L. Smith, of the United States Department of Agriculture. This book has already been reviewed in these columns.

Among subjects discussed in *Vitamines and the Choice of Food* are beriberi, scurvy, the discovery, distribution and quantities required of the vitamines, their chemistry and physical properties, rickets, keratomalacia, hunger, osteomalacia, pellagra, the effect of partial deficiencies in food, and errors in selection of food; the appendix gives in tabular form the distribution of the vitamines. The authors' preface contains excellent references, both to books and periodical literature, on vitamines and related subjects.

To the reviewer familiar with the American form and presentation of popularized scientific literature, *Vitamines and the Choice of Food* seems rather heavy and technical for general reading. This is doubtless in accord, however, with the British principle of not "coddling" the public, and of giving people for consumption the thing itself, with an eye to educating them, not a descientized version of it—and there is a good deal to be said in favor of this method!

MODERN CONCEPTS OF THE NERVOUS SYSTEM.

The Form and Functions of the Central Nervous System. An Introduction to the Study of Nervous Diseases. By Frederick Tilney, M. D., Ph. D., Professor of Neurology, Columbia University; Attending Neurologist, the Presbyterian Hospital, and Henry Alsop Riley, A. M., M. D., Associate in Neurology, Columbia University; Associate Attending Neurologist, New York Neurological Institute. Foreword by George S. Huntington, Sc. D., M. D., Professor of Anatomy, Columbia University. With Five Hundred and Ninety-one Figures Containing Seven Hundred and Sixty-three Illustrations, of which Fifty-six are Colored. New York: Paul B. Hoeber, 1921. Pp. xxiv-1020.

This work is one of the best on the nervous system that has been produced in this country. More than stressing the modern concept of form and function, it presents the anatomical and functional relationships of the nervous system so closely that it will be with difficulty that they can ever again be isolated. The work is scholarly and extremely complete for a first edition. The task of completing a book of this character has been tremendous but the need that it supplies more than justifies the effort of its authors.

The somatic proprioceptor and metabolic mechanisms are described in turn. Sensory and motor components are then outlined. The embryological considerations are set forth in all the clarity which has characterized their former presentations by Dr. Tilney before his student classes. Neurologists will not all agree with some of the authors' deductions regarding the integrity of certain isolated nerve cells, but this need not in any measure detract from the value of the work. This has to do with concepts, which are of value no doubt, but can be determined after more mature consideration. From now on there is more clear sailing. With systematic precision the salient points are discussed of form and function of the spinal cord, anatomical, histological, functional (into the finer divisions of white and grey matter), and finally the syndromy. Then comes a general consideration of brain and medulla, then the pons, cerebellum, midbrain, interbrain and forebrain.

There are over a thousand pages in the book. Some may complain of its bulk, but the subject could not be handled more neatly or be more condensed to be of any value. There are no short cuts in this all important field. There may also be criticism regarding the stressing of certain findings of American workers, but when we study the book more carefully we find a very fair balance has been struck.

The publisher, Paul B. Hoeber, has proved himself equal to the great task of producing a book of this character and has turned out a volume containing over seven hundred illustrations, fifty-six of which are in color, all printed in splendid fashion. The book should prove a standard textbook wherever neurology is taught and should be read by every medical man who is really interested in the vital functions of the human organism.

DENTISTRY.

A Textbook of Clinical Periodontia. A Study of the Causes and Pathology of Periodontal Disease and a Consideration of Its Treatment. By Paul R. Stillman, D. D. S., and John Oppie McCall, A. B., D. D. S. New York: The Macmillan Company, 1922. Pp. xvii-240.

Pyorrhea alveolaris is a disease of the tissues investing the roots of teeth. This disease was first observed and named by Dr. Riggs of America more than a half century ago. As the name implies, it is a flow of pus from alveolar regions. For many years, however, it has been conceded that this is not the whole story, and that the actual flow of pus is merely a symptom of one of a series of stages of the periodontal disease. A little more than a decade ago the term pyorrhea alveolaris was definitely recognized to include any one of the stages, beginning with a mild gingivitis and ending with a complete disintegration of the periodontal tissues. That this proved confusing is evidenced by the fact that pyorrhea in the minds of some dentists and many physicians still means a flow of pus and the disease remains undiagnosed in its incipient stages.

The advent of the new term dental periclasia is most welcome and should immediately supplant the more obsolete pyorrhea alveolaris. The many ramifications in the etiological consideration of dental periclasia are carefully outlined by two such able observers as Stillman and McCall in their work on clinical periclasia. It becomes apparent that the prognosis of the disease is dependent upon the proper etiological diagnosis and that exodontia is not the panacea. Clinical experience and careful radiographic interpretation of alveolar tissues for the early detection of the disease are the best of our present day weapons for combating an otherwise enigmatical malady.

It is interesting to note that only secondary importance is given to tissue inferiorities and that even greater emphasis is given to mechanical irritants as primary causative factors. Included among the well known list of calcareous deposits, bad fillings and inlays, shell crowns, fixed bridges, etc., we find an additional primary causative factor styled by the authors as traumatic occlusion. Traumatic occlusion is defined as an undue stress against any tooth or any part of a tooth during the normal mandibular excursions of mastication. This undue stress or disturbance in normal function produces the trauma to the periodontal tissues, which results in a slower or more rapid breaking down of the periodontium depending upon the degree of tissue inferiority. The correction of traumatic occlusion, the removal of calcareous deposits, bad fillings and inlays, shell crowns and fixed bridge work or any other mechanical contrivance interfering with normal function, is the work of the dentist, and together with general oral prophylaxis will serve to bring to resolution a large variety of cases otherwise destined for the forceps.

Clinical Periodontia should be read by dentists because it will definitely add to their clinical data regarding the periodontal disease and help them to classify the numerous causative factors; it should be read by physicians because it will permit them to place a greater reliance upon the diagnostic and prognostic opinion of the dentist regarding the disease.

PHYSICAL THERAPY.

Massage and Medical Gymnastics. By Dr. Emil A. G. Kleen and Various Contributors. Second Edition. New York: William Wood & Co., 1921.

Kleen's original treatise on massage appeared in Swedish in 1890 and was promptly translated into German and English. In 1918 the work was brought up to date through the collaboration of Dr. Arvedson, Dr. Haglund, and Dr. Zander, and an English translation was made by Mina L. Dobbie. This second edition has been carefully revised by the translator. Dr. Kleen is still the responsible editor of the work, and finds that in the past two decades there has been but little to add to the teaching of massage. Dr. Arvedson contributes the section on Ling's medical gymnastics; Dr. Zander that on the Zander system of exercises, while Dr. Haglund writes of massage and gymnastics in orthopedics. Of the original editions up to 1918, three thousand copies have been sold and the present revision will doubtless meet with the same degree of success.

THE ABDOMEN.

Pathologische-anatomische Situsbilder der Bauchhohle. Von Dr. Siegfried Oberndorfer, a. o. Universitätsprofessor, Vorstand des pathologischen Instituts am Krankenhous Munchen-Schwabing. Mit 92 Tafeln in Kupfertiefdruck und 92 Abbildungen im erklarenden Text. Munchen: J. F. Lehmann's Verlag, 1922. Pp. 133.

Author and publishers have combined to produce a volume of unusual beauty. By means of copper plate photogravures the author has shown a series of ninety-two full page etchings, representing the normal and pathological aspects of the abdominal organs. Each etching is faced on the opposite page by a reproduction in black and white, fully described by a brief text. The author has been doing abdominal photography for the past fifteen years, as an aid in teaching abdominal pathology, and it must be said to his credit that he has perfected his technic to a most remarkable degree. One can but marvel at the beauty of these photographs, especially in those representing tuberculous peritonitis, in which the typical miliary tubercles are beautifully portrayed.

As an aid to the study of diseases of the abdomen and the surgery of its organs, we believe that this little volume ought to be indispensable. A careful study of these exquisite reproductions by the surgeon must inevitably result in a clearer conception of the conditions with which he has to deal, as well as in a better technical understanding on the operating table. While the field for such work as this naturally is limited, we cannot but feel that this volume must be of great value to every surgeon and pathologist. However skilled and experienced in actual surgical practice, no surgeon can fail to profit by a careful study of the photographs presented in this work, in which utility and art are so strikingly combined.

INFORMATION FOR THE LIMBLESS.

Handbook for the Limbless. Edited by G. Howson, Formerly Officer in Charge of Curative Workshops, Special Surgical Hospital, Sheperd's Bush, London. With Foreword by John Galsworthy. London: The Disabled Society, 1922. Pp. 200.

This remarkable little volume of two hundred pages has been published for the purpose of encouraging those who have lost limbs to realize how to overcome their disability. It is pregnant with the thought that given the will power, the possibilities for the limbless are very great. In his foreword Galsworthy calls this little book "an indomitable document," besides being a veritable mine of information and useful "tips." In reviewing this work one is deeply impressed with the fact that the many men in England made limbless in the war have indeed overcome the handicap induced by their maimed condition, and Galsworthy marvels, as must every reader, at some of the feats they have attempted and succeeded in doing.

The editor of the work tells of a man with both legs amputated who drove an automobile eleven thousand miles without a mishap of any kind. Another man, with arms amputated above the elbow, tells how he learned to write by placing the pen between his teeth. When he got his artificial arms he could do nothing at first, but perseverance and the will to succeed brought about almost unbelievable results. This man now dresses and undresses without assistance; uses a fork for feeding; mounts and rides a bicycle; digs his garden; plays billiards, and, best of all, plays the piano. Perhaps the most striking incident mentioned in the book is the swim at Brighton, three quarters of a mile, when sixteen men participated; of these three were minus one arm, ten minus one leg, and three had double amputations. All finished the course except one who was seized with cramps in his stump.

The volume is replete with incidents of this kind which show how wonderfully the maimed, in England, have adapted themselves to their handicaps, both in the industrial field as well as in the realm of sport. Boxing, fencing, swimming, and other athletic endeavors are described and fully illustrated, as they apply to the limbless.

Much of the space is devoted to demonstrating that the light leg is superior to the heavy artificial limb, but that it is much more expensive and therefore cannot be supplied as freely as the heavy limbs. In the long run, however, the metal limb has proved to be about twenty per cent. cheaper than the heavy wooden one.

There is so much matter of interest both to the maimed as well as to the unmaimed that it is difficult to touch on them all. This book ought to be within reach of every man or woman who has suffered the loss of a limb. In order to make this possible, the Disabled Society is selling the book at a very low price, well within the modest means of those who most need its useful information—in fact, at less than cost price. It is a work that will more than repay a careful reading and study.

POISONING.

What to Do in Cases of Poisoning. By William Murrell, M. D., F. R. C. P., Formerly Senior Physician to the Westminster Hospital Twelfth Edition, Revised by P. Hamill, M. D., D. Sc. C., F. R. C. P., Lecturer on Pharmacology and Therapeutics, St. Bartholomew's Hospital. New York: Paul B. Hoeber, 1921. Pp. 273.

Dr. Hamill, lecturer on pharmacology and therapeutics in St. Bartholomew's Hospital, London, has brought this little work up to date. The eighth edition appeared as far back as 1897, and the tenth in 1907. These are the only editions to which the reviewer has access. The number of pages shows no increase over former editions and is indeed fewer, despite the incorporation of new material. Industrial poisoning is included but the editor expressly states that poison gas and other war chemicals are left out as obsolete.

SPEEDY PSYCHOANALYSIS.

Practical Psychoanalysis. An Introductory Handbook. By H. Somerville, B. Sc., F. C. S., L. R. C. P., M. R. C. S. New York: William Wood & Co., 1922. Pp. ix-142.

Even for a work as slight as this more accuracy would be welcome. After a careful reading of it one comes to the conclusion that a popular exposition of psychoanalysis in a sketchy fashion such as this one can not be done. Wrong impressions are given and the whole important subject is reduced to a trivial few words. Just what the author means by "It is considered that anyone who has read this little work carefully should now be in a position to commence a psychoanalysis," is difficult to determine. It is at least optimistic.

ESSAYS BY ELLIS.

Little Essays of Love and Virtue. By Havelock Ellis. New York: George H. Doran Company, 1922. Pp. ix-187.

A series of charmingly written essays on the topics of love and sexuality. Present day problems are considered in a broad understanding way. The various aspects of the sexual life and their complications are set forth. Ellis speaks of the older views and how they came to be and shows their weaknesses. He also discusses various proposed reforms and presents their advantages and defects. Birth control, sexual abstinence, the objects of marriage, and the play function of sex are some of the topics discussed. The little brochure should prove interesting to medical men who so frequently encounter these problems in practice.

Medicoliterary Notes.

Dr. S. Dana Hubbard, director of the Bureau of Public Health Education of New York City, is the writer of a series of pamphlets on facts about sex for parents, young men and women, and boys and girls. The series may be obtained from the publishers, The Claremont Printing Company, New York. The titles are: *Truth About Quacks and Self Medication, Sex Knowledge for the Mature Mind, Sex Facts for the Adolescent and Matured Woman, Facts About Motherhood, Facts About Marriage Every Young Man and Woman Should Know, and Sex Facts for Young Boys.* Although Dr. Hubbard seems a bit old fashioned in some of his psychology of marriage, and in spite of the fact that the pamphlets, perhaps in the attempt to be popular, are rather carelessly written, the information is accurate, well chosen and wholesome, and for these reasons valuable. The pamphlets constitute probably the best sources of information on sex for very popular consumption to be had in medical literature, and the writer is performing a commendable service in making such information so easily available.

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A free drug dispensary has been opened in Moscow by the American Relief Administration. It is situated in a beautiful white stone building, once the home of a famous pianist. A woman graduate pharmacist is in charge of it. The supplies are distributed free of charge to any one in Moscow who comes with or sends in a prescription signed by a reputable physician of the city.

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Edwin Grant Conklin has in the *Yale Review* for July an article on The Future of Evolution.

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Harper's Magazine for July publishes an interesting paper by Dr. W. B. Cannon in which he discusses the importance of the emotions in mobilizing the physical forces of man. This number of the magazine contains some excellent fiction for summer reading.

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A plea for the doctor who is a helpful human being before all, not a man of science only, appears anonymously in the July *Century* under the title Our Medicine Men.

* * *

The annual report of the Roosevelt Hospital for 1921 gives an interesting tabulation by nationalities and races of the 5,393 patients admitted to the hospital during that year. Americans numbered 3,155; there were 529 Irish; 148 Germans; 153 English and Scotch; 47 French; 135 Scandinavians; 365 Italians; 23 Swiss; 39 Spaniards; 155 Austrians; 47 Poles; 147 Russians; 226 West Indians; 57 South Americans; 91 Turks and Greeks; 31 Chinese and Japanese; 10 of unknown nationality, and 35 miscellaneous.

* * *

The calendar of the faculty of medicine of the University of Toronto lists two courses for 1922-23 which show the general tendency of modern scientific medicine to broaden both its base and application by contact with other sciences. The first of these courses is a series of lectures illustrating the influence that modern scientific thought and achievement have had on the development of modern civilization. The second course is in expression and includes instruction in the correct use of written and spoken English. Opportunity will be given each student to acquire experience in public speaking. Both are first year courses.

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The municipal government of Kansas City, Mo., has published a detailed report of some four hundred pages of a milk survey recently made in that city. The report includes information on statistics, prices, dairy farms, bacteriological tests, institutions supply, infant mortality and child health, bovine tuberculosis, milk control, regulations, etc.

* * *

An interesting and instructive revelation brought out by the recent National Negro Health Week, held under the auspices of Tuskegee Institute and various negro organizations in cooperation with the U. S. Public Health Service and several American health organizations, was the fact that eight years ago in New York City the death rate of negroes was seventy per cent. higher than that of white persons. By the creation and observance of more sanitary conditions, this has been reduced, but only nine per cent.

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The Massachusetts Institute of Technology is holding a summer school including courses in public health and public health education.

* * *

The U. S. Public Health Service, in cooperation with the Seamen's Church Institute of New York City, has prepared a timely little book called a *Manual of Ship Sanitation and First Aid.* The purpose is to furnish to officers and men of the American merchant marine simple but comprehensive information on ship hygiene and sanitation, an outline of surgical treatment suitable for use on ships, and necessary data for the treatment of diseases.

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New Publications Received.

NERVE EXHAUSTION. By MAURICE CRAIG. Philadelphia: Lea & Febiger, 1922. Pp. 148.

READINGS IN EVOLUTION, GENETICS, AND EUGENICS. By HORATIO HACKETT NEWMAN. Chicago: The University of Chicago Press. 1921. Pp. xviii-523.

HAY FEVER AND ASTHMA. By WILLIAM SCHEPPEGRELL. Philadelphia and New York: Lea & Febiger, 1922. Pp. x-274.

INDIVIDUAL GYMNASTICS. By LILLIAN CURTIS DREW. Philadelphia and New York: Lea & Febiger, 1922. Pp. vi-225.

LES ULCERES DIGESTIFS. Par PAUL CARNOT, PAUL HARVIER, PAUL MATHIEU. Paris: Librairie J. B. Bailliere et Fils, 1922. Pp. 159.

PATHOLOGY OF THE NERVOUS SYSTEM. By E. FARQUHAR BUZZARD and J. GODWIN GREENFIELD. New York: Paul B. Hoeber, 1922. Pp. xv-334.

AN INTRODUCTION TO DERMATOLOGY. By NORMAN WALKER, LL. D., M. D., F. R. C. P. Seventh Edition. With Eighty-four Plates and Eighty Illustrations in the Text. New York: William Wood & Co., 1922. Pp. xviii-366.

Practical Therapeutics

PREVENTION AND TREATMENT OF SUMMER DIARRHEA.

By J. Epstein, M. D.,
New York,
Attending Pediatrist, Vanderbilt Clinic; Chief of Pediatric and Cardiac Clinics, Beth Israel Hospital.

The care and treatment of diarrheal diseases in infants and children, especially during the summer months, is of perennial importance. The relatively greater demand for food in early life with its predominant digestive and metabolic functions, the seasonal influence on the vitality of the young child and the effect of the heat on the composition of the food, all tend to make infants and young children susceptible to gastrointestinal diseases during the summer months. Under the influence of the hot weather and other atmospheric and barometric changes, the child becomes heat sick or heat exhausted and prone to digestive disturbances and bacterial infection.

While the usual foods of infants and children may undergo fermentation, putrefaction, and bacterial contamination and cause digestive disorders, milk, which forms the exclusive diet of the infant and the main diet of the child, is frequently laden with bacteria and their toxins and is the most common source of infectious diarrhea in early life.

Excessive feeding, too frequent feeding, and unsuitable food are common causes of gastrointestinal indigestion during the summer months. Even infants at the breast are not immune from gastrointestinal upsets during the hot days, especially when cool nights follow hot days. So prevalent and varied are the causes of diarrheal illness during the summer months that it is looked upon as an annual visitation.

A considerable variety of microorganisms are concerned in the production of summer diarrhea in children. Most of them are of the normal inhabitants of the intestinal flora, as Bacillus coli, lactis aerogenes, putrificus, acidophilus and bifidus, which under certain abnormal conditions, either in the child or in the food, become pathogenic. Some organisms which are usually not present in the intestinal soil, as the Bacillus dysenteriæ, enteriditis, pyocyaneus, various staphylococci and streptococci may invade the body and cause diarrheal diseases.

The pathological changes in the gastrointestinal tract vary with the severity of the illness. Catarrhal and degenerative changes are most common. Inflammation with small hemorrhages is present in ileocolitis. Ulcerations are not infrequent in the subacute and chronic conditions. Degenerative changes in other organs are seen as a result of toxemia.

The chemical and the biological functions of digestion are in abeyance or perverted during diarrheal illness. There is a peristaltic restlessness which prevents proper absorption of food. The salivary secretion may be dried up as a result of the loss of fluid. The gastric juice may be diminished or inactive and the pancreatic ferments feebly active.

For diagnostic, therapeutic and prognostic purposes all cases of summer diarrhea in children may be divided into the following three definite groups: 1, The gastrointestinal indigestion group, or indigestion diarrhea; 2, the gastroenterocolitis group, or infectious diarrhea; and 3, the toxic choleraic group. or toxic diarrhea.

Except for the frequent bowel movements and occasional vomiting, most of the children of the gastrointestinal indigestion group do not appear sick. Some may complain of abdominal pain, have slight fever and look distressed. If the condition is long continued they become emaciated and worn out. The prognosis is good.

The chief characteristics of the gastroenterocolitis group are the sudden onset with high fever and prostration. There is vomiting, abdominal pain, and frequent bowel discharges with considerable mucus and some blood. The child looks very ill, is irritable, and the face expresses great distress, later becoming apathetic. The prognosis is doubtful.

In the toxic choleraic group, the onset is sudden and stormy. The temperature is high, the body surface cold, with stupor and coma rapidly developing. Meningeal symptoms may be present. There is early incessant vomiting, abdominal pain and frequent large, watery bowel movements. The tongue is dry, the urine scanty, and the child looks dehydrated and shrunken. The prognosis is grave.

TREATMENT.

Prompt and rational treatment of diarrheal diseases during the hot summer months is of the utmost importance. If not properly treated, the intestinal tract drains the body of its vital fluid and the child becomes desiccated and shrivelled and dies.

A large number of drugs are being used in the treatment of diarrhea in children and a variety of prescriptions are being written. A popular remedy for this disease is lime water. This is a solution of calcium hydroxide in water. When purchased in different drug stores, it may be found to be either a clear inert water or a strong dirty solution. Its remedial virtues are based on its alkalinity and astringency, but it is of doubtful therapeutic value, unreliable in its preparation, and disagreeable in taste. Its general use in infant feeding is unnecessary, it probably does nothing else but spoil the taste of the milk. Another popular remedy is the antiquated chalk mixture. On standing for some time it forms a sticky, gritty mass. Whatever its value may be as an antidiarrheal remedy it is frequently made incompatible and worthless by combining it with various drugs and digestive ferments. Tincture of gambir or catechu, tincture of kino, and tincture of krameria are all used to control diarrhea. Their therapeutic claims are based on the tannic acid they contain. In the doses usually prescribed the child gets a trace of tannic acid which has no effect. All these tinctures could be left out without loss to modern therapeutics. Tannigen, tannalbin, tannoform, tannopin, and tannismut are all tannic acid preparations. Some of them were formerly used a great deal with good results. But with the advent of a better knowledge of dietetic and hygienic measures in intestinal diseases, they are now less in therapeutic vogue. Of the intestinal antiseptics, salol, betanaphthol, resorcin, ichthalbin and guaiacol carbonate are occasionally used. Salol and guaiacol carbonate are probably the best. The bismuth salts still hold the first place in the treatment of diarrhea. Bismuth subcarbonate, bismuth subnitrate, bismuth subgallate, bismuth salicylate and bismuth betanaphthol are all frequently prescribed. There is, however, no advantage in any of the bismuth preparations over the subcarbonate which should be used. Protein milk is occasionally used in diarrheal diseases both as a food and as a medicine, on account of its high protein and low sugar and fat content. It consists of protein, three per cent.; fat, 2.5 per cent.; sugar, 1.5 per cent.; salts, 0.5 per cent., and water. When given in the fermentative or carbohydrate type of diarrhea where the stools are brown or slightly green and watery with a sour smell and and an acid reaction, it does much good. It forms a constipating alkaline stool which is antagonistic to the acid forming fermentative organisms. The buttermilk which is used in the preparation of protein milk would seem to be contraindicated in the fermentative type of diarrhea. When protein milk is used indiscriminately, it is of little therapeutic value. The Bacillus bulgaricus in tablet or liquid culture is frequently used. Its field of usefulness is limited to the putrefactive or protein type of diarrhea, which is caused by proteolytic organisms. This kind of diarrhea can be diagnosed clinically by the green, foul smelling, alkaline stools which contain mucus and some curds. The active Bulgarian bacillus inhibits the growth of the proteolytic organisms especially in the presence of lactose. Its metabolic products probably neutralize the protein toxins. In any other type of diarrhea, its use is a therapeutic injustice. Sour and fermented milk which contains lactic acid may be similarly used. Castor oil and starvation are the two remedies most frequently used as the first aid in diarrhea. While a clearing out of the gastrointestinal tract followed by a temporary complete rest from all kinds of food is essential in the successful treatment of diarrhea in children, it is too often used indiscriminately. Many young children have been unduly weakened and their chances for recovery lessened by an injudicious use of castor oil and starvation. It not infrequently happens that attending physicians are changed and each in turn repeats the same routine treatment of castor oil and starvation until the child is more sick from the treatment than from the disease.

Since summer diarrhea in children is the result of combined factors of meteorological changes and dietetic errors, prophylaxis is of the first importance. The child should not be unduly exposed to the sun during the day, or to the chilly air of the night which frequently follows a hot day. Light, loose clothing during the day and a warm shirt during the night will prevent diarrheal trouble. Plenty of fresh country air, or if needs be city air, and a liberal supply of cool or tepid water to the skin will ward off many a diarrhea. The caloric requirement of the child is less during the hot season because less food is required to maintain the body temperature, therefore less food, weaker food and at longer intervals should be given with plenty of water between meals.

When a child is ill with diarrhea and clinically belongs to the gastrointestinal indigestion group, dietetic and hygienic treatment will cure the little patient. If breast fed it should be nursed at longer intervals and one or two tablespoonfuls of boiled warm water should be given before each nursing. For the bottle fed and for those that receive a mixed diet, the general rule of less food, weaker food and at longer intervals is the proper regimen. Medically, beyond a good dose of castor oil or calomel, nothing else is necessary. A few drops of paregoric with some aromatic syrup of rhubarb, or, for older children, the rhubarb and soda mixture, will do good in some cases.

In the gastroenterocolitis group, the child should be in bed and receive the best general care and nursing. Sips of water or weak tea should be the sole diet for twelve or twenty-four hours but no longer. There is no advantage in barley water or rice water or any other cereal decoction. Later, careful and proper feeding is most important. The kind of food depends on the diarrhea, whether putrefactive or fermentative, the age of the child, the digestive ability, and the general condition of the little patient. Breast milk should be diluted by giving water before nursing. As milk is the greatest breeding medium for bacteria, only the best milk should be used and this should be brought to the boiling point before it is given to the child. Milk low in fat and diluted with some thin gruel is well borne by the little patient. Other foods may be added according to the condition of the child and the kind of diarrhea, which is occasionally difficult to determine. In the putrefactive type of diarrhea the diet should contain mostly carbohydrates, while in the fermentative kind of diarrhea proteins should be mainly given. Medically, a preliminary dose of castor oil should be given. Then the most valuable remedy is codeine in small doses, one fortieth grain for a baby one year old, one thirtieth grain for a baby two years old, one twentieth grain for one three years old. When given every three or four hours it will quiet the child, control the diarrhea and soothe the spasmodic intestinal tube. Bismuth subcarbonate and sodium bicarbonate with pancreatin may be used with benefit. It aids in the digestion of the food, prevents acidosis and is soothing to the intestinal tract. Strychnine and brandy as stimulants may occasionally be necessary. Gastric lavage is very useful in persistent vomiting. Colonic irrigation with warm normal saline, or a weak sodium bicarbonate solution will flush the colon and at the same time add some fluid to the body which it sorely needs. A cool wet compress to the abdomen will help a great deal.

The treatment of the toxic choleraic group is based on the same general principles. Thorough intestinal elimination should be followed by temporary starvation. Codeine will always do good. Bismuth subcarbonate in liberal doses should be given. Strychnine, atropine, digitalis, caffeine and brandy are essential in circulatory failure. What the child needs most in this serious illness is external heat and water internally which should be supplied by hot water bags or the hot water pack to the body, and by colonic irrigation with a solution of bicarbonate of soda or hypodermoclysis of normal saline solution. A carefully selected diet must be supplied. As the toxic diarrhea is mostly caused by proteolytic organisms, the aim should be to change the toxic intestinal protein flora to a carbohydrate flora by giving lactose, dextrin, maltose, dextrinized gruel and skimmed lactic acid milk.

In a great many children there is an associated bronchitis with the summer diarrhea which is frequently overlooked. It seems that the atmospheric conditions which cause diarrhea also cause bronchorrhea. The extreme heat probably acts through the nervous system on the mucus lining of the respiratory and the gastrointestinal tracts producing excessive intestinal and bronchial peristalsis, excessive glandular activity, and a ready soil for bacterial invasion. It is quite possible that in some cases there is a primary bronchitis with the intestinal tract secondarily infected through swallowing the sputum which young children invariably do.

The prophylactic and hygienic treatment of diarrhea applies also to bronchorrhea. Good fresh air and suitable nourishing food will aid the child in its recovery. Guaiacol carbonate combined with iron carbonate, saccharated, works well in the subacute and chronic diarrheal and bronchial diseases.

213 EAST BROADWAY.

The Modification of Cow's Milk in Infant Feeding.—Eric Pritchard (*Lancet*, April 29, 1922) enumerates the following physiological requirements for all methods of infant feeding:

1. The caloric value must be sufficient to supply all the demands of growth and repair, heat production, mechanical work, and the elaboration of secretions.
2. The ratios between the proteins, fats and carbohydrates must be about 1.5, 3.5 and 7.0—those of human milk.
3. All the accessory factors, as salts (organic and inorganic), lecithin, cholesterol, extractives, vitamines, etc., must be adequate in quantity.
4. The food should not only be adjusted to the infant's digestive capacity at the time, but it should also promote their further development.
5. The food must not contain pathogenic bacteria and it must be given at such intervals and in such a manner as to promote the development of good habits. The failures of artificial foods must be judged by immediate results instead of by long deferred effects.

Practically, a baby under one year of age requires fifty calories a day for every pound of body weight, but in addition the proper proportion of proteins, fats and carbohydrates. The addition of a few ounces of broth, made from bones and mixed vegetables, can supply the deficiencies and is a practical way of supplementing cow's milk dilutions. If the milk is diluted half and half it should be predigested at first and the time of predigestion gradually decreased. Cow's milk should always be sterilized, as the sterilization does not change the digestibility of milk in any way. The following formula is recommended:

Milk (average quality)	10 ounces
Cream (thirty-three per cent.)	1 ounce
Sugar (lactose, and later maltose and cane sugar, equal parts)	1 ounce
Broth	4 ounces
Water to make	1 pint

This humanized milk has a caloric value of twenty. The broth is made from one pound of bones (with marrow), one tablespoon vinegar, and one and one half pints water, which is allowed to simmer for eight hours, and then a handful of mixed vegetables and Irish moss (iodine) are added and allowed to simmer one hour longer. This is allowed to jell. This supplies gelatin and all the other accessory foods.

Calcium Content of Blood Plasma and Corpuscles in the Newborn.—Martha R. Jones (*Journal of Biological Chemistry*, November, 1921) reports her investigations on the calcium content of the blood of normal infants ranging from four hours to twelve days old. Sixty-eight determinations on twelve boys and ten girls showed the following average volumes: whole blood 8.8 mg. to 100 c.c.; corpuscles 5.0 mg. and plasma 12.3 cm. The average calcium content of blood plasma is higher in the newborn than in older children, while the corpuscle and whole blood values are less. The plasma values remained constant throughout the twelve days included in the series of observations, while the corpuscle averages tended to decrease and those of the whole blood to increase. During the experimental period the average percentage of red blood cells dropped from 55 to 41.9 per cent.

Fat Soluble Vitamine.—H. Steenbock and Mariana T. Sell (*Journal of Biological Chemistry*, March, 1922) present data which further emphasize the occurrence of fat soluble vitamine most prominently where the largest amounts of certain yellow pigments are found. White sweet potatoes and white carrots contained little fat soluble vitamine, in marked contrast to the yellow pigmented varieties. The tops of white carrot roots, slightly pigmented with chlorophyll and containing a small amount of yellow pigment, were richer in fat soluble vitamine than the bottoms containing only half as much pigment. Green cabbage leaves taken from the heart of the cabbage plants which had failed to "head" were much richer in fat soluble vitamine than white cabbage leaves in the head, the latter containing only one tenth as much yellow pigment.

Acute Intestinal Intoxications in Infancy and Early Childhood.—Junius A. Rawlings and Harry Leigh (*Southwestern Medicine*, May, 1922) believe that prophylaxis is of the greatest importance and therefore a baby should never be prematurely weaned without a definite indication. Milk supply should be carefully supervised, as even boiling does not make milk good nor render spoiled milk safe. Protection against chilling by the wearing of woolen or part woolen bands is advisable up to the end of the second summer. Active treatment is not specific; at the outset stop all food for twelve to thirty-six hours; give boiled water with a one or two per cent. soda bicarbonate content in one half to two ounce quantities at intervals of fifteen minutes upwards. Castor oil is usually contraindicated from its tendency to provoke vomiting; calomel and soda are preferred for rapid catharsis. Colonic irrigations of a gallon of normal salt and two per cent. soda solution are desirable. Severe cases require morphine, gastric lavage, subcutaneous or intraperitoneal injections of normal saline, five per cent. glucose or Ringer's solution. Hot or tepid packs are analgesic and quieting.

The Rôle of Concentrated Cereal Milk Mixtures in Early Infancy.—Gaylord W. Graves (*American Journal of the Medical Sciences*, April, 1922) records observations drawn from a series of eleven cases which correspond closely with those of previous observers and reinforce the claim that thick cereal is of exceptional value in controlling vomiting dependent on pylorospasm. The use of similar feedings in conjunction with nursing may likewise have a desirable antispasmodic action on both stomach and intestine. Applicability of the thick cereal method to certain acute forms of diarrhea, which are not favorably affected by the usual protein milk regimen, may later be established. The improvement at a very critical stage manifested in a case of ileocolitis with projectile vomiting is not without significance, while tolerance for the thick cereal exhibited by two premature infants who had assimilated liquid food poorly is worth emphasis. The cereal of choice is farina, because of its property of great expansion under cooking, thus permitting of thickening the mixture with a minimum amount of added starch. Three or four tablespoonfuls in a twenty ounce formula will ensure sufficient solidification by the time cooking has reduced the quantity one third, although greater concentration may at times be advisable. The amount of water to be used is not arbitrary. Skimmed milk, evaporated milk, dry milk powder, or breast milk may be incorporated in preference to whole milk. For an infant under six months two or three tablespoonfuls at a feeding ordinarily suffices.

Proceedings of Societies

AMERICAN PEDIATRIC SOCIETY.

Thirty-fourth Annual Meeting, Held in Washington, D. C., May 1, 2 and 3, 1922.

The President, Dr. Maynard Ladd, of Boston, in the Chair.

Applied Dietetics in Outpatient Departments.—Dr. Maynard Ladd, of Boston, in his presidential address, stated that so far as he could learn there were very few institutions which had established and operated food clinics of the kind he had in mind. The purpose of the food clinic might be called a demonstration of applied dietetics. It was intended to assist the physicians of medical clinics in carrying out food treatment. It was distinctly a part of the medical institute, in which the medical dietetic, social and economic problems of each case were correlated. It was not a centre for the distribution of food. It necessarily included the "nutrition classes" but had a much larger scope. The fundamental principle of organization was that every patient accepted must be under direct medical supervision by one, who by virtue of his specialty or experience, might be judged competent to determine the nutritional requirements of the case. It was the duty of the food clinic not only to follow the lines of treatment indicated by the physician, but to investigate through medical social service the home conditions, economic resources of the family, and, when necessary, to bring the case into relation with proper agencies of help. Medical supervision should be directly exercised within the food clinic, in order that all departments might work in harmony.

In general the organization of a food clinic was the same as that of any medical clinic and should be on the same plane. Its special internal organization Dr. Ladd described under three heads, namely, 1, administrative; 2, dietetic, and 3, educational. The head of the food clinic should be the medical consultant, whose duties were primarily medical. He kept in touch with the general progress of the cases and saw that the patients reported back periodically to the special clinics from which they had been referred. He gave medical instruction in applied dietetics to classes, to graduates, and to undergraduates. The other members of the staff were the chief dietitian and her assistants, the trained nutrition worker, and the social worker and clinic executives. A competent dietitian would be permitted to exercise her own initiative in many cases (such as obesity, constipation and undernourishment) but there were other groups, such as renal, cardiac, diabetic and tuberculous, which required close and frequent medical supervision. The functions of the dietitian were to determine the family budget, and its possibilities of supplying the necessary food which the diet called for. She might be able to advise a cooperative mother how to readjust her expenditures, so that the proper food might be provided, and she could instruct her in the art of utilizing cheaper products to attain the same end served by the more expensive foods. Instruction in regard to the simple facts relating to food and methods of preparing it was given by demonstration in the class to groups of mothers and children and by home visits in special cases, by the food worker to help the mother apply the principles taught in the class.

Still another function of the food clinic was to conduct classes which had a special objective. They had, for instance, established classes in obesity, constipation, malnutrition and diabetes. The nutrition class for undernourished children was one of the most important of the special groups of the food clinic. Such classes were being extensively organized throughout the country. The problem of handling the undernourished child was not, however, as simple as the layman might infer when he saw untrained persons qualify as chief nutrition workers after a two weeks' course of instruction. Malnutrition, if severe, was always primarily a medical problem, and required long continued supervision.

A clinic organized along the lines indicated would offer a training to students in medicine, public health, child welfare, nursing, dietetics and social service. Such a food clinic should become an established department of every well organized clinic for the treatment of ambulatory patients. Its development would depend upon the extent to which public opinion supported the idea. As pediatrists who were largely concerned with the problems of nutrition, and food as a means of attaining it, they should lend their support to the idea of a food clinic which could do much to put applied dietetics on a scientific basis, and greatly influence public opinion as to its importance. At the same time by the precept and example of well regulated clinics, much might be done to clarify the subject of food in relation to disease.

The Splenopneumonic Reactions in Pulmonary Tuberculosis of Children.—Dr. P. F. Armand-Delille, of Paris, sent this communication, calling attention to a form of congestive reaction of the lungs, giving the clinical type of the socalled Grancher's splenopneumonia but invading the whole lung. Often after a continued fever, called in France Landouzy's typhobacillosis, the signs of consolidation of one lung appeared by degrees. Many of these children had had symptoms of tracheobronchial adenopathy, but not in all cases. Sometimes these signs began at the apex, sometimes at the base, and at the beginning it appeared to be a pleurisy, because all the symptoms were given that Grancher described under the name of splenopneumonia, but very often the entire lung was invaded at the same time. The vibrations disappeared and sometimes the tubal breathing was so strong that it took the amphoric character, and one thought it was a cavity in the lung or a bronchial dilatation.

Radioscopy showed a complete or nearly complete opacity of the whole lung, contrasting with the normal aspect of the other lung, but the diaphragm was not immobilized as in pleurisy, the mediastinum was not pushed aside and contrary to the aspect in pleurisy, the shadow was thicker in the median part of the the lung than at the base, in the neighborhood of the pleural sinus, which sometimes kept a light transparency. One could sometimes observe in a limited area, more often in the apex, a clearer zone of disintegration, which gave the aspect of a cavity, modified by coughing; this aspect corresponded to the cases in which austultation gave râles, and corresponded to the focus of tuberculosis. In some cases—which seemed to correspond to the pure splenopneumonia forms, the resorption could come progressively if helped by general physiotherapeutic treatment, especially with very well regulated heliotherapy, but it was always very slow and not complete. In other cases, after a certain time, the lung was invaded by caseification, and it became a real caseous pueumonia with terminal large cavities. In a third type of cases it became an organization of the consolidation, a sclerosis of the lung appeared with pleural adhesions, retraction of the wall of the chest, attraction and deviation of the mediastinum, and sometimes later bronchial dilatations.

The occurrence of these special forms of splenopneumonic reactions were not as rare as one might think. Out of 120 children in the writer's ward for tuberculosis, it had been observed during the past three months in more than ten cases. Cases of this kind had often been considered to be pleurisy, and only x ray examination and the practice of artificial pneumothorax could explain their real nature.

D'Espine's and Allied Signs in Childhood.—Dr. John Lovett Morse, of Boston, stated that, in view of the difference of opinion as to what constituted D'Espine's sign, he had looked up the original descriptions and had communicated with D'Espine himself. It was evident that the sound to which D'Espine originally called attention was a whispered sound following the spoken voice and heard over the spinous processes. Normally no such sound was heard. This sound was believed by D'Espine to be the earliest sign of enlargement of the tracheobronchial lymph nodes. He also believed that the bronchial character of the spoken voice did not normally extend below the seventh cervical spine and that extension of the bronchial sound below this point was evidence of enlargement of the tracheobronchial lymph nodes. He paid little attention to the character of the whispered voice (meaning by this a whisper, not the whispering sound heard after the spoken voice) and believed that extension of the bronchial respiratory sound of dullness on percussion below the seventh cervical spine was a still later manifestation and signified much more marked changes.

In view of the great differences of opinion as to the terminology the writer examined a series of 118 children between the ages of two and fourteen years. In eighty-eight cases, or nearly seventy-five per cent., there was no whispered sound after the spoken voice; in twenty-four it was heard through the seventh cervical spine, and in six below it as well. It seemed evident, therefore, that a whispered sound after the spoken voice was not the usual condition and was probably abnormal. The change from bronchial to vesicular in the spoken voice between the seventh cervical and first dorsal spines in ninety of the children and above it in nine. There was no bronchial voice anywhere in nine; in only six did the bronchial voice extend below the seventh cervical spine. The change from bronchial to vesicular whisper took place between the seventh cervical and first dorsal spines in eighty-seven instances. The change from bronchial to vesicular respiration occurred between the seventh cervical and first dorsal spines in ninety-seven instances. In only fifteen, or less than thirteen per cent., did bronchial respiration extend below the seventh cervical spine. The spinal dullness stopped at the seventh cervical spine in ninety-five cases and above it in one.

A detailed analysis of these cases made it seem fair to conclude that when there was no whispering voice sound after the spoken voice, the bronchial voice, whisper and respiration, and the spinal dullness did not extend below the seventh cervical spine, and there was no intrascapular dullness, conditions were normal. It seemed probable that they were not normal when the bronchial voice, bronchial whisper, bronchial respiration and spinal dullness extended below the seventh cervical spine. They were certainly abnormal when there was intrascapular dullness. The whispering sound after the spoken voice, D'Espine's sign, was often the earliest and only abnormality. It might, however, be absent when one or more of the other signs were present. The whispered voice was a somewhat more delicate test of pathological changes in the tracheobronchial region than was the spoken voice. The respiratory sound had an intermediate value. The value of percussion over the spinous processes was about the same as that of the respiratory sound. Intrascapular dullness was a late sound and was found only when the pathological changes were considerable.

Dr. Charles Hendee Smith, of New York, agreed that D'Espine's signs had been misinterpreted. D'Espine had said "the vertebral column between the seventh cervical and first dorsal vertebra," perhaps D'Espine meant the seventh cervical; it seemed to him that for the whispered sound it could be nothing else. The whispered sound was more accurate than the speaking voice. Perhaps it would be advisable to abandon the expressions positive and negative D'Espine's sign and say that the whispered voice extended to the first cervical or to the first, second, or third dorsal vertebra, as the case might be.

Followup Records of a Series of Patients with Bronchopneumonia.—Dr. Walter Lester Carr, of New York, stated that in 1919 there were 237 patients with bronchopneumonia admitted to the Pediatric Service of the City Hospital. Of this number 179 had bronchopneumonia and 8.5 per cent. of them died. Dr. Guilfoy, of the Department of Health, stated that in 1920 there were 2,384 deaths in New York from bronchopneumonia in children under two years of age, while in 1921 there were only 1,557. We could not give in percentage what proportion of the children who were ill with bronchopneumonia died, but the statistics of the Henry Street Settlement for 1920 give 1,377 cases of bronchopneumonia in children below two years cared for by visiting nurses, and of these 193 died, a percentage of 7.4. Assuming this mortality to be correct the mortality table of the Department of Health would show a disease incidence of nearly seventeen thousand cases for twelve months.

In a recent communication in the *J. A. M. A.* (July 23, 1921) attention was directed to the importance of home care for children with bronchopneumonia and urging such treatment wherever possible. For comparison the article gave the mortality in acute bronchopneumonia as 117 of 282 cases in one institution, and twenty of forty-eight cases in another. These figures for home care and nursing seemed so unusually good for a disease so treacherous as bronchopneumonia that they led the writer to attempt to solve some discrepancies of the mortality of hospital patients under his own observation, both in the hospital and after leaving the institution. It was interesting in studying the mortality of a disease treated within a hospital or at home to compare the incidence of the disease not only by age but by epidemic influence. For example, in the recent 1922 mild epidemic of influenza there were children with bronchopneumonia who did well in the hospital and patients in their homes recovered without a high mortality.

In private practice, children with measles, as the writer had observed them during the past few months, had not had bronchopneumonia as a fatal complication. Without a knowledge of bronchopneumonia and its average mortality we could not accept wholly this percentage of calculation of home care and mortality, especially as the statistics of the Henry Street Settlement by nurses in charge showed that about ten per cent. of severe cases of bronchopneumonia were sent to hospitals and their calculations were misleading to this extent. Compared with a mortality of 7.4 per cent. in the children cared for by the Henry Street Settlement in 1919, the mortality rate for children under two years of age cared for at the City Hospital during an influenza epidemic was not excessive, nor was it especially favorable to visiting nurses as during the year 8.5 per cent. of children under two years with bronchopneumonia were referred to hospitals by nurses. The complete figures of a followup series from the City Hospital showed the advantage of checking up patients after they had left the hospital. Without intending to disparage the value of home nursing, comparison had been made with the Henry Street Settlement statistics to show that no one agency could completely determine the mortality of a disease like bronchopneumonia which in its association with epidemics and its close association with tuberculous changes might give a low mortality rate in one calculation and a high one in another. To determine the results of hospital treatment in bronchopneumonia followup visits by social service workers and nurses from settlements should be made and patients should report back to hospitals for reexamination.

Hydrogen Ion Concentration of the Gastric Contents.—Dr. W. McKim Marriott, Dr. L. T. Davidson, and Dr. L. P. Harshman, of St. Louis, stated that the object of this investigation was to examine the processes of digestion from the viewpoint of the newer physiology and chemistry and to observe the alterations in the processes as determined by the character of the diet. The effective acidity of hydrogen ion concentration was to a large extent dependent upon the character of the diet. Certain foods had the property of binding or practically neutralizing a considerable amount of acid, due to their content of "buffer" substances. Milk was a good example of a food containing a large amount of buffer material. Cow's milk contained a much greater amount of buffer substance than did breast milk. Observations on the behavior of breast milk, as compared with cow's milk on the addition of varying amounts of hydrochloric acid, showed that to bring cow's milk to the same degree of acidity as breast milk required approximately three times as much hydrochloric acid as in the case of breast milk. The character of the milk fed, therefore, influenced the degree of hydrogen ion concentration in the stomach. In general, greater degrees of acidity were observed in older infants.

It had been shown that peptic digestion was slight at a degree of acidity less than pH 4.0, but that from this point on considerable digestion occurred. In two thirds of the infants examined the acidity was quite sufficient to allow for considerable digestion of protein. The bacteria present in milk, particularly those of the colon typhoid group, were inhibited markedly by an acidity corresponding to pH 5.0. In a consideration of the acidity of the gastric contents of infants who were not normal, but were fed exclusively on breast milk, there was a marked variation from the normal figures. The infants in this group were in a condition of athrepsia or suffering from acute infections. In every instance the acidity was less than that corresponding to a pH of 4.0. The degree of acidity was insufficient for peptic digestion, not great enough for complete bacterial inhibition, and presumably below the optimum for effect on the pyloric sphincter and on the duodenal secretions.

A study of the behavior of cow's milk in the stomach of normal infants shows that the excess of buffer substances bound the hydrogen ions and it appeared that the infant's stomach did not respond by producing a sufficient amount of acid to overcome the excess of buffer substance. There were various ways by which the removal or neutralization of the buffer substances might be accomplished. A simple one was the artificial souring of the milk; here the buffer substance was greatly altered by the lactic acid. The question as to whether it was possible to feed undiluted cow's milk to babies provided it had been soured was investigated. The experience of a number of years had led them to conclude that such milk might be given to even young babies without the appearance of symptoms which resulted when the cow's milk with unchanged buffer was administered, and they believed the buffer effect to be important in explaining this fact.

Experiments on babies had shown better absorption and retention of both organic and inorganic constituents during lactic acid milk feeding. In infants with lowered gastric acidity, as, for example, athreptic infants, a more nearly normal hydrogen ion concentration of the gastric contents was obtained when lactic acid milk was fed than when breast milk was fed. It was just in this type of infants that the lactic acid formulæ had been of the greatest value. The writers felt that gastric acidity and the buffer value of infants' food were factors of distinct importance in infant feeding and that these factors had not been sufficiently emphasized in the past.

Dr. John Howland, of Baltimore, Md., expressed doubt as to whether a low hydrogen ion concentration was a common finding in celiac disease.

He had had patients with that condition in whom the hydrogen ion concentration of the stomach contents was higher rather than lower than normal. It was almost too early to say whether a lessened secretion was the cause or the result of the disease.

Acid Milk in Infant Feeding.—Dr. HENRY L. K. SHAW, of Albany, stated that the principal objections to the use of buttermilk in infant feeding were that it was difficult to procure with any degree of regularity and its composition and degree of acidity varied with each churning. Lactic acid milk was not open to these objections. The albumin in acid milk was more digestible and could be given to young infants in larger proportions than in sweet cow's milk. There was no evidence to show that lactic acid milk caused chemical or bacterial injuries to the infant.

In the preparation of buttermilk as recommended by different authors the food was boiled before it was used. This was also the case in the preparation of acid milk and albumen milk. A bacteriological study of these foods at the New York State Department of Health Laboratory showed no growth of lactic acid organisms in the boiled foods so that the favorable results must be due to the high acid content and not to the action of living lactic acid bacilli. The amount of acidity was determined by titration with a decinormal sodium hydrate solution with phenolphthalein as the indicator. A large number of acidity determinations of acid milk were made in the laboratory of St. Margaret's House by Dr. Frank J. Williams who assisted the writer in this study, and the average acidity before boiling was 100 and after boiling it was reduced to eighty. The high acidity exerted a remarkable germicidal effect. Tests of the urine acidity made during the course of this study showed that there was no increase in the acidity but that the acidity was diminished in the majority of cases examined.

Dr. Shaw said that in 1910 in the Infants' Home, he had adopted the de Mattos method of preparing artificial buttermilk in which whole milk is soured by the addition of a lactic acid culture and after coagulation sugar was added and the milk boiled for three minutes. It was safe to state that over three thousand babies had been raised on this food with more or less success. Other methods had been tried during this period, but the Sisters had always requested a return to the sour milk mixtures, as the babies gained faster, looked healthier and were happier. Made in large quantities it was easy to prepare and had several advantages for use in infants' institutions.

The use of sweet milk has been discontinued and acid milk used in the preparation of all malt soup mixtures. Made with the acid milk the acidity averaged about 48. Dr. Shaw said they were not using plain malt extract which did not contain the alkali with very satisfactory results and this had an average acidity of 65. In the preparation of acid milk, more recently a technic has been used recommended by Miss Thesinghe, a trained nurse from Holland who claimed that it was the method in general use in that country. Fresh whole milk was poured into a bowl, covered with cheese cloth and allowed to sour for two days in a warm room until thick like junket. It was then churned in a small glass butter churn for several minutes until it resembled fluid milk. A heaping tablespoon of sugar and one of flour for each quart were mixed into a paste with a little of the milk and this was added to the churned milk and then boiled from three to five minutes while stirring. By adding a little soured milk to the fresh milk as a "starter" it would sour sufficiently in twenty-four hours. This could be fed without dilution to very small infants, although it was best to add one half to one ounce of water in each feeding for the first few days. Up to May 1st, forty-six babies received this food at St. Margaret's, besides fourteen in private practice. In order to preserve the antiscorbutic vitamine one half the formula was boiled while the other half of the acid milk was added uncooked. The babies fed on acid milk mixtures for a long period of time in institutions looked healthier and thrived better on the average than those fed on the regulation sweet milk formulas.

(*To be continued.*)

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Letters to the Editor.

AN EXPLANATION.

NEW YORK, *July 17, 1922.*

To the Editor:

In an issue of *The Medical Record,* published by the undersigned on December 17, 1921, there appeared a letter, signed by Dr. John P. Davin, addressed to our Editor under the heading "The Narcotic Agent and the Physician." On March 31, 1922, Ralph H. Oyler, United States Narcotic Agent in Charge, in the State of New York, of the enforcement of the Federal statute regulating the sale and use of narcotic drugs, known as the Harrison Act, brought an action for libel against us and Dr. Davin, based on the publication of this letter.

At the time of the publication thereof, we did not know Mr. Oyler and did not know that he occupied the position of narcotic agent in charge in the Southern District of New York. The letter contained no reference to Mr. Oyler *by name* and we published it, believing it merely a criticism of the regulations of the United States Treasury Department concerning the prescription of narcotic drugs by physicians. We did not then realize, as we now do, that Dr. Davin's letter referred to Mr. Oyler and is libelous in its reference to him.

We had no intention of reflecting upon Mr. Oyler's character, or his ability properly to perform the duties of his office. As far as we have been able to ascertain, by investigations made since the article was published, Mr. Oyler is a zealous and efficient public servant and has capably performed his duties as narcotic agent in charge in the State of New York. We sincerely regret the injustice which has been done to Mr. Oyler by the article which we published.

WM. WOOD & CO.,
WM. C. WOOD,
GILBERT C. WOOD.

Abstracts from Current Literature

PEDIATRICS

Painful Pronation in Young Children.—J. Comby (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris,* May 25, 1922) reports the case of a male child one year old who, while lying in his coach, was subjected to a sharp jolt as the nurse pushed the coach suddenly forward to escape from an oncoming automobile. The child's right arm was extended up holding on to the hood of the coach, and at the time of the jolt he cried out with pain and thereafter held the arm motionless. Next day the baby was still unable to use the arm, but no evidence of fracture could be found. The author recognizes the case as an instance of the painful pronation of young children, described by A. Broca some years ago. Usually the disturbance results from sudden traction on the child's arm when he stumbles while attempting to walk, the result being a slight trauma to the elbow which displaces the head of the radius. The author's case was treated with success by the method already recommended by Broca for these cases, viz., by turning the forearm into supination with the right hand, making pressure on the head of the radius with the left hand, and then strongly flexing the forearm on the arm.

The Tolerance of Children for Digitalis.—Hugh McCulloch and Wayne A. Rupe (*Southern Medical Journal,* May, 1922) come to the following conclusions: 1. The method of administering massive doses of digitalis to children should be the same in detail as for adults.

2. The use of massive doses to children is entirely practicable, and under proper supervision possesses no source of danger.

3. The amount of digitalis necessary to produce clinical improvement coincides with the amount necessary to produce vomiting and a fall in heart rate. These two phenomena may be taken as criteria that an optimum therapeutic effect has been obtained.

4. Children with heart disease require an amount of digitalis to the kilo of body weight which is about fifty per cent. greater than would be required for adults.

5. There are two indications for the use of digitalis in children. First, those who are suffering from heart disease and who are in a state of chronic cardiac failure. Second, those who have a regular rapid heart rate when that heart rate cannot be slowed by other measures.

6. Massive doses of digitalis are contraindicated in two groups of children with heart disease: first, those who have an acute infectious or toxic myocarditis; second, those who are suffering from acute cardiac failure with hearts that are overloaded.

A Case of Renal Dwarfism.—Donald Paterson (*Lancet,* May 13, 1922) reports the case of a child six years old who was always well and came to operation for knock knee which had developed during three and one half years. The urine showed albumin, no casts, a pale color, and the maximum excretion of urea was considerably diminished. The röntgenograms revealed "woolly" diaphyses with straight epiphyseal lines; the lower ends of the femora showed a marked irregularity of the epiphyseal lines with a definite fracture of the lower end of the diaphysis extending into the epiphyseal line, resembling cases of renal dwarfism. The same agent that produces renal fibrosis also produces bony changes. This agent is not dietetic in character. The fractures are due to a weakening of the bone by a deficiency of osteoid tissue and absence of lime, especially near the epiphyses.

A Case of Congenital Pyloric Stenosis, With Interesting Sequelæ and Suggestions.—R. Eccles Smith (*Lancet,* May 13, 1922) reports a case to show that an incarcerated appendix in a hernial sac may be one of the factors, not only of primary causation, but also of continuation of congenital pyloric stenosis. The points of interest were: 1. A rare type of congenital hypertrophic stenosis with complete block from birth. 2. Vomiting was relieved on the sixteenth day after operation, apparently by circumcision and palliative measures. 3. The possibility of an acute appendicitis being the real cause, which was overlooked. It is possible that the appendix fixed in the hernial sac, causing stagnation and alteration in the duodenal contents with a response in the pyloric sphincter, produced and maintained the congenital hypertrophy of the pylorus.

The Antiscorbutic Vitamine.—E. B. Hart, H. Steenbock and S. Lepkovsky (*Journal of Biological Chemistry,* May, 1922) cite data on its solubility from desiccated orange juice. They say that the antiscorbutic vitamine of desiccated orange juice is soluble in eighty per cent., ninety-five per cent., and absolute ethyl alcohol, and in methyl alcohol. It is insoluble in butyl alcohol, as well as in benzine, petroleum ether, acetone, ether, chloroform, and ethyl acetate. They conclude that the behavior of this vitamine toward organic solvents and water indicates that it is not of fat or lipin character.

Scurvy.—E. B. Vedder (*Military Surgeon,* November, 1921) in a discussion of the etiology of scurvy concludes that: 1. The antiscorbutic vitaliment is neither acid nor a salt of an acid, since an extract from which all acids and salts have been removed both prevents and cures scurvy. 2. The antiscorbutic vitaliment may be stored without impairment for at least several months in a neutral aqueous solution. 3. When orange or lemon juice is neutralized and diluted with alcohol it retains the antiscorbutic vitaliment if fed immediately, but this vitaliment is destroyed when this solution is stored. 4. When orange juice is extracted with alcohol, acetone, neutralized, and the soluble portion stored in alcohol, the solution cures and prevents scurvy, but does not produce normal growth. The antiscorbutic vitaliment must be altered in some manner by this treatment, but not entirely destroyed. 5. A similar result is obtained when orange juice is extracted with alcohol, acetone, neutralized, and the dry residue extracted by ethyl acetate.

Leucemia and Severe Anemia in Childhood.—John Lovett Morse (*Boston Medical and Surgical Journal,* May 18, 1922) presents a study of thirty-seven cases of this nature met with during the past twenty-five years. He concludes that myelogenous leucemia is a most unusual condition in childhood. Lymphatic leucemia is uncommon, but occurs much more frequently than the myelogenous type. More common than either is a severe and rapidly fatal type of anemia, in which there is a most profound depression of all the functions of the bone marrow. In certain instances there may be associated with it an increase in the productiveness of the lymphatic organs. The line between this condition of lymphatic leucemia is at times somewhat indistinct. It strongly resembles, if it is not identical with, the aplastic anemia of adults. Its relation to the purpuras can only be determined by more careful study by modern methods. Its etiology is not evident, but analogy suggests that it may be the result of some intoxication or infection. The ordinary type of pernicious anemia of adults is extremely rare in childhood.

Fracture of Skull in Children.—Moorhead and Weller (*Annals of Surgery,* July, 1921) from a statistical study of one hundred cases of fracture of the skull in children conclude as follows: 1. A combination of vault and basal injury can be expected in a very large percentage in which the injury has been severe, and when the violence has not been direct and localized in character; in the latter, vault fracture is more usual. 2. The mortality in this series was twenty-six per cent., in which five per cent. followed vault fracture, and ten per cent. basal and eleven per cent. combined vault and basal injury; stated in another way, involvement of the base gave a mortality of twenty-one per cent., four times that of the vault. If associated injuries are excluded, our mortality is only seventeen per cent. 3. Early death (within forty-eight hours) was due to the head injury or associated injury; thereafter infection in the form of meningitis, often pneumococcic, was the chief factor. Sixteen of the patients died within twenty-four hours, four within forty-eight hours; this means that over three fourths (76.7 per cent.) of fatalities occurred in the first two days. 4. Fifty-one per cent. of the quoted cases involved the vault with a mortality of five per cent.; seventeen per cent. involved the base with a mortality of ten per cent.; thirty-two per cent. involved base and vault with a mortality of eleven per cent. 5. By comparison with adults children have a twenty-five per cent. better chance for life with an equal grade of skull injury. 6. The number of cases requiring operation is relatively small; in this group twelve per cent. were operated upon.

Suction Difficulties of Young Infants.—B. C. Cameron (*Lancet*, May 13, 1922) finds the specific causes of suction difficulties to be: 1. Lack of appetite and refusal to suck during various infective disorders or intoxications; 2, dyspnea; 3, prematurity; 4, local defects in the mouth and lips; 5, injury during birth; 6, extreme somnolence, and 7, nervous excitement.

Basal Metabolism of Underweight Children.—Katharine Blunt, Alta Nelson, and Harriet Curry Oleson (*Journal of Biological Chemistry*, November, 1921) give the results of basal metabolism determination of two groups of children, most of them underweight. The basal metabolism of these children tended to be higher than that of the normal child. In some cases the excess metabolism was as high as forty per cent. above that read from curves given by Benedict and Talbot, and in most cases the metaolism was not only higher than the curve, but higher than the highest observation of the child of the same weight from which the curve was drawn. No close relation was observed between the percentage of underweight and the excess metabolism.

Value of Vaccines in the Treatment of Whooping Cough.—Donald Paterson and James M. Smellie (*British Medical Journal*, May 6, 1922) followed sixty-four cases treated with vaccine. Of these six hospital cases received biweekly injections and the rest (ambulant cases) received weekly injections. The dosage was as follows: Initial injection of Bordet's bacillus 500 million, Pfeiffer's bacillus 125 million, pneumococcus 25 million; second injection, Bordet's bacillus 1,000 million, Pfeiffer's bacillus 250 million, and pneumococcus 50 million; third and subsequent injections, Bordet's bacillus 2,000 million, Pfeiffer's bacillus 500 million, and pneumococcus 100 million. In the cases treated with vaccine the average duration of the whoop was 4.8 weeks, and in the unvaccinated cases 4.4 weeks. Even in the vaccinated cases treated in the first or second week before the whoop developed, the shortening of the disease was negligible. Weekly or biweekly injections influenced neither the duration nor the severity of the disease either favorably or unfavorably. The injections were painful and upset the children considerably, especially the larger doses. The authors therefore believe that the use of vaccine is unjustified.

RESPIRATORY DISEASES

Hydrogen Ion Concentration and Bicarbonate Level of the Blood in Pneumonia.—A. L. Barach, J. H. Means and M. N. Woodwell (*Journal of Biological Chemistry*, February, 1922) presents the carbon dioxide diagrams of the blood in ten new cases of pneumonia, in three of which observations were secured before and after the crisis, in one before and after oxygen therapy, and in two cases before and after the administration of sodium bicarbonate. Among their conclusions are the following: The alkali of the blood in pneumonia as shown by the level of the carbon dioxide dissociation curve was found sometimes to be within normal limits, sometimes somewhat below normal limits. It is suggested that in pneumonia patients showing acidosis either in the sense of a low level of available blood alkali or of decrease in pH or combination of the two, the administration of sodium bicarbonate may be helpful by diminishing the work of the respiratory bellows. The use of sodium bicarbonate should be carefully controlled, however, to avoid the production of alkalosis, and when anoxemia is present should be combined with oxygen therapy.

Treatment of Anoxemia in Pneumonia in an Oxygen Chamber.—William C. Stadie (*Journal of Experimental Medicine*, March, 1922) reports eight cases of pneumonia, all having a high degree of anoxemia and presenting grave prognoses, which were treated in an oxygen chamber. These patients can apparently breathe oxygen varying from forty to sixty per cent. for a long time without harm. Oxygen administered to intensely anoxemic patients almost immediately clears up the anoxemia, cyanosis disappearing also, but if these patients are removed from the high oxygen while still sick with extensive edema and infiltration of the lung, there will be a return of the intense anoxemia. At times it is impossible to clear it up, when there is considerable edema and infiltration of the lungs, even when sixty per cent. of oxygen is given. Five of the patients recovered, and in all the cases there was apparently an improvement in the patients' condition.

A Clinic for the Diagnosis of Tuberculosis in Children.—Karl Peyrer (*Wiener klinische Wochenschrift*, April 20, 1922) recommends the following procedure, in view of the occasional difficulty in the diagnosis of tuberculosis in children: A history of the child should be taken with special attention to sources of infection, predisposition, former tuberculous diseases of the child and present complaints, especially fever, loss of weight and cough. The clinical findings, especially in the lung, are then recorded. Tuberculin tests are then made and if found negative a Pirquet reaction is made on the second day with 0.1 mgm. or 1.0 mgm. injected subcutaneously. The röntgenological examination includes fluoroscopy and röntgenograms. In suspicious cases the sputum is examined. The diagnosis is made according to the following scheme: 1, absence of tuberculosis; 2, inactive tuberculosis; 3, inactive tuberculosis with a tendency to activity, and 4, active tuberculosis with mention of its localization; the infectiousness, open tuberculosis, or facultative open tuberculosis should also be mentioned. The significance of the finding should not be overestimated as a temporary negative finding is no guarantee against the future progression of tuberculosis. The patient should be taught the unreliability of single examinations and that he must return two or three times for tuberculinization and fluoroscopy. Such a plan would form a valuable link between child welfare and tuberculosis welfare. In the author's advisory service for mothers regarding two hundred and sixty infants in a child welfare department during four months, eleven cases of tuberculosis were positively diagnosed.

Serum Treatment of Lobar Pneumonia.—L. W. McGuire (*Boston Medical and Surgical Journal*, March 23, 1922) gives several reasons why a large number of physicians are not convinced of the value of the treatment of Type I lobar pneumonia with Type I antipneumococcic serum. It must be remembered that thus far it has not been possible to produce a serum in the other types of pneumonia which has sufficient protective power to warrant its use, so the use of serum is restricted to Type I alone. 1. Some physicians do not employ serum early in the disease, but the best results are obtained from early use, and it is dangerous to wait until the patient is critically ill. 2. They attempt to treat what they consider only the serious cases, but no one can tell when a moderately sick patient will become critically ill. 3. They do not use sufficient serum. Large amounts can be given a patient who is not sensitive to horse serum, but before any is given at all the patient should be tested for such sensitiveness, and sensitive patients must be desensitized before the treatment will be safe. 4. They do not type the pneumonia, but this is absolutely essential. 5. Some use a polyvalent serum and not a specific Type I serum. There is no warrant for the use of a mixed or polyvalent serum, there is no excuse for its use, and it is to be mentioned only to be condemned.

The Local Application of Tuberculin.—James Crocket (*British Medical Journal*, April 29, 1922) asserts that while tuberculin is not a specific for pulmonary tuberculosis, small doses at weekly intervals are effective, especially when combined with other treatments: it aids in the progress of the disease, if in addition to the hypodermic application it is also used locally in gland cases, lupus and in abdominal tuberculosis. For lupus or adenitis it is used as an ointment with a base of anhydrous lanolin, and for abdominal or pulmonary tuberculosis it is used as a liniment in strengths varying according to the reactive power of the patient, the aim being a definite local reaction, such as roughening or reddening of the skin or a papular eruption. The general reaction must be avoided. Koch's old tuberculin T. or P. T., or preferably equal parts of both, is used in four strengths: IV is a dilution of 1:4; III, 1:3; II, 1:2, and I, 1:1. For glands, treatment is begun with the weakest dilution, rubbing in the size of a pea. If a reaction results the same strength is used every five days; if there be no reaction, the stronger form is used. If the reaction is very severe with the weakest dilution, still weaker dilution (up to 1:20) must be used. Other surgical treatment may be necessary, such as the aspiration of caseous matter, the cleansing of ulcerated areas with acid nitrate of mercury or pure lysol, the injection of Calot's oil or paste, or bipp into sinuses, or ultraviolet rays. The local action is aided by röntgenization with Sabouraud's pastille, the application of thirty mg. radium for twenty minutes or four successive days, screening with one and one half mm. lead and the injection of tuberculin, beginning with 0.0000001 c. c. every seven days and increasing the dose gradually up to pure tuberculin. For local use in pulmonary and abdominal tuberculosis, the tuberculin is mixed with compound camphor liniment, one to five min. to one drachm, beginning with the weakest strength and increasing, if there be no reaction, till the maximum is reached, and applied every three to five days covered with a flannel binder.

Significance of Influenza Bacilli.—Arthur L. Bloomfield (*Bulletin of the Johns Hopkins Hospital,* May, 1922) regards the question as to whether the influenza bacillus is the cause of influenza as settled in the negative. The relation it bears to the disease and its general significance form the basis for this discussion. He concludes from his extensive studies that the high incidence of influenza bacilli in the throats of healthy people which was present during and after the pandemic has declined to the normal or preepidemic figure. There is no convincing evidence that the incidence of influenza bacilli in healthy people varies with the incidence of mild respiratory infections. He states that in the case of the influenza bacillus group we have organisms which show a marked variation at various times in their adaptation to growth on human mucous membranes. A variety of altered conditions, especially acute infectious diseases, may produce this change, but epidemic influenza does so to an extreme degree.

Lung Suppuration.—P. W. Aschner (*Annals of Surgery,* March, 1922) asserts that lung suppurations may be divided into: 1. Bronchiectasis, a general disease of the bronchi in one or more lobes. 2. Bronchiectatic abscess, a localized suppurative process in the course of a bronchus, and thus far observed only in posttonsillectomy cases. 3. Suppurative pneumonitis, a diffuse purulent process. 4. Extrabronchial abscess, a localized purulent process. Certain interesting histological changes have been observed: 1. Metaplasia in bronchial epithelium. 2. Epithelial lining of bronchiectatic abscess and some smaller abscesses of Group 3. 3. Proliferation of smaller bronchioles and air passages resembling proliferation of the bile passages in portal cirrhosis.

Diphtheria Bacillus Carriers.—B. C. Marshall and C. G. Guthrie (*Bulletin of the Johns Hopkins Hospital,* March, 1922) state that when dealing with throat cultures from diphtheria carriers, the usual laboratory practice of making single or repeated examinations within the first twenty-four hours may not give all the information available, and may lead to erroneous conclusions. As judged from their results in 1,125 cases, the error from this source alone is 9.5 per cent. They recommend that in the study of either healthy or convalescent diphtheria bacillus carriers all cultures which are negative up to twenty-four hours be reexamined after another day in the incubator.

Etiology of Influenza.—M. W. Hall (*Military Surgeons,* September, 1921) asserts that little has been advanced tending to strengthen the claim of the Pfeiffer bacillus to be regarded as the active cause of the disease. The failure of many trained investigators to find Bacillus Pfeifferi in the great majority of their cases, and the serological heterogeneity of strains, even from closely related cases, seem to be arguments against the etiological relationship of this organism to epidemic influenza. French, British, German, and American investigators have all reported success in producing, by means of bacteriologically sterile filtrates, lesions that correspond well with the essential pathology of uncomplicated influenza as deduced from numerous descriptions. Most of these investigators have failed to reproduce the clinical complex of the disease in this way. Only occasionally acute illness or even death has occurred after inoculation with filtrates. Olitsky and Gates describe the uniform occurrence of leucopenia. When the last named investigators found their lesions complicated by secondary infection, either through accident or design, the clinical complex and postmortem findings of acute influenza were satisfactorily reproduced. They were able to show that the lungs of animals injected with the filterable influenza substance were markedly more susceptible to infection by known bacteria than are control animals. Bacteria that ordinarily kill by septicemia without localization are localized in the lungs and produce acute pneumonitis. The writer has made a similar observation. E. C. Rosenow and Blake and Cecil have also been able to produce conditions clinically and pathologically comparable to influenza by the intratracheal injection of bacteria. The conditions produced by these investigators appear to be very similar if not identical to those described by Olitsky and Gates. The exciting bacteria, however, were not the same, Rosenow using green producing streptococci, and Blake and Cecil the Pfeiffer bacillus. The suggestion is made that the filterable agent is capable of growing symbiotically with certain of the known bacteria without materially changing the character of the resultant colony; that when both agents are thus present in culture, injection produces findings comparable to those of influenza in man; and that this conception is in harmony with the known facts of the unity of influenza, its usually mild course, its severe or fatal course when dominated by secondary infection and with the fact that the secondarily invading organisms vary in their nature in different localities. A few suggestive experiments are offered in support of this hypothesis.

Causation of Adenoids.—Piero Brisotto (*Riforma Medica,* May 1, 1922) reports on a series of one hundred and fifty cases of adenoids observed in his clinic. Certain congenital lues was present in forty cases and probable lues in forty-six more, giving a percentage of fifty-six per cent. of all cases showing either certain or probable congenital syphilis. In twenty-four per cent. tuberculosis was found and in eight per cent. a combination of both congenital lues and tuberculosis. Brisotto believes that adenoids should be looked upon as an expression of the decadence of the race, especially provoked by syphilis, but also determined in many other ways. Brachycephaly, palatal defects, rickets and defective dental development play an important part in the causation of adenoids.

Nontuberculous Infection of the Lungs.—H. Milton Connor (*Minnesota Medicine,* June, 1922) selects twenty-eight cases for review from a larger series of cases observed in the Mayo Clinic from March, 1920, to December, 1921. He believes that nontuberculous infection of the lung is a nonspecific disease which, however, deserves a name as a separate disease entity. The essential features are cough, marked chronicity, exacerbations, little or no fever, few constitutional symptoms, usually purulent expectoration, lack of progression, and location of the lesion almost always in the bases. The principal physical sign is moist râles. The diagnosis is made mainly by chronicity of cough, little effect on general health, locations of signs in the bases, and persistent absence of bacilli of tuberculosis. In the differential diagnosis, chronic bronchitis, tuberculosis, frank bronchiectasis, and bronchopneumonia must be considered. The prognosis must be guarded in adults and the treatment is mainly by posture, by inversion of the body at least four times daily for a ten or fifteen minute period. This may be done by kneeling on a chair with the hands on the floor, by assuming the Trendelenburg posture (or reversed Trendelenburg), or even by hanging the body over the edge of the bed. Most of the patients were given steam inhalations with benzoin or beechwood creosote two or four times daily; in some cases the creosote was given internally as well.

Management of Tuberculous Laryngitis.—William V. Mullin (*Southern Medical Journal,* June, 1922) believes that treatment should begin with careful attention to the nose and throat. Cough will irritate the larynx and this irritation will aggravate the cough. The intratracheal injection of a soothing oil is of great service in breaking this vicious circle; the laryngeal syringe is preferred to the swab as it avoids trauma. A slightly verrucose thickening in the posterior laryngeal wall often gives the scratchy feeling of a foreign body; this annoyance will often disappear after several light applications of the galvanocautery. Infiltrations will usually respond to rest and mild palliatives, such as weak iodine solutions and argyrol, but edematous swellings will probably require deep cautery puncture. When ulcerations are numerous and extensive and the pain great, Freudenthal's orthoform emulsion will give most relief. Heliotherapy in some cases seems to have an almost specific effect. Tuberculomata, Mullin prefers not to remove as they rarely break down, and he removes them only if they prevent phonation or produce cough.

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NEW YORK, WEDNESDAY, AUGUST 2, 1922

SURGERY

Operations for Gallstones.—G. Barling (*British Journal of Surgery*, October, 1921) asserts that removal of the gallbladder rather than draining it should be the routine procedure. An easier and safer recovery follows. Removal of the gallbladder does not prevent recurrence of stone in the common duct, but I see no reason to believe that it adds to the likelihood of recurrence.

Technic of Gallbladder Surgery.—G. W. Crile (*Surgery, Gynecology and Obstetrics*, November, 1921) states that before operation employ saline infusion, blood transfusion and heat. At operation employ analgesia, local anesthesia, means to maintain temperature of liver, decompression of bile, nothing more. After operation employ blood transfusion, saline infusion, three thousand to four thousand cubic centimeters; application of heat to liver, intermittent drainage of bile. Avoid deep inhalation, anesthesia, needless handling, morphine, doing too much. Decompress and no more.

Surgical Treatment of Goitre.—W. E. Sistrunk (*Surgery, Gynecology and Obstetrics*, January, 1922) gives the following surgical indications for goitre: 1. Plummer divides all goitres into three classes: colloid, adenomatous, and exophthalmic. 2. Colloid goitres occur in young persons, are not surgical, and respond to treatment with iodine and thyroxin. 3. Adenomatous goitres usually appear in young persons. Twenty-three per cent. of the patients with adenomatous goitres seen in the Mayo Clinic show symptoms of hyperthyroidism, but these symptoms do not develop until the goitre has been present for an average of about sixteen years. In young persons, unless the goitres attain considerable size or produce symptoms of pressure, they are not considered surgical. In the majority of instances after patients with adenomatous goitre have attained the age of twenty-five or thirty, surgery is advocated. All adenomatous goitres associated with hyperthyroidism are considered surgical if the condition of the patient will permit an operation. 4. Exophthalmic goitres occur at any age, but most often between the ages of twenty and forty. The condition is best treated surgically and the best results are obtained in patients operated on early in the course of the disease before marked damage has been done to the vital organs. Many patients require one or two ligations of the superior thyroid vessels preliminary to thyroidectomy in order to make thyroidectomy a safer procedure. If care is exercised in selecting the type of operation which should be performed in a given case, the mortality following operation is low.

Treatment of Spiral Fractures.—E. Rixford (*Annals of Surgery*, November, 1921) gives the following technic in the treatment of spiral fractures: Determine the location and form of the fracture by x ray plates so taken as to locate that part of the spiral portion of the fracture which is opposite the longitudinal component. Cut down on this spiral part of the fracture and remove all detached chips of bone and larger fragments, if not required as a part of the splintage, and drill both fragments, if possible, *in situ*, or with a minimum of disturbance of their position, locating the holes at such points as after reduction will make the line joining them lie obliquely to the spiral in such wise as most effectively to resist torsion displacement. In general this line will be transverse to the axis of the bone. Pass a stout silver wire through the drill holes. Reduce the fracture by traction, rotation and leverage, taking care not to break the bone, lifting out any periosteal or fibrous tabs from between the fragments along the spiral, and being careful not to strip up the periosteum. Draw the wire taut and twist, hammering the ends down against the bone. Close the wound and apply some sort of efficient retentive appliance, a properly fitting Thomas splint or plaster of Paris cast. Remove the retentive appliance frequently for massage, mobilization of the joints and electrical development of the muscles and arrange for the patient to make functional demand at the earliest reasonable moment.

Bone Grafting.—C. A. McWilliams (*Annals of Surgery*, November, 1921) from a study of the values of various methods of bone graftings judged by 1,390 reported cases gives the following conclusions:

1. There were 82.3 per cent. of successes with 17.6 per cent. of failures.

2. In the order of successes, we have, a, with bone pegs. 95.8 per cent. were successful; b, with the osteoperiosteal method (Delageniere), 87.3 per cent. were successful; c, with the end to end method (without inlaying), 82.5 per cent. were successful; d, with the inlay method, 80.9 per cent. were successful; e, with the intramedullary method (Murphy), 76.6 per cent. were successful; f, with the combined intramedullary (at one end) and the inlay (at the other), 60 per cent. were successful.

3. The presence or absence of periosteum seems to exert no influence on the success of bone grafts. Proportionately, the percentage of successes without periosteum (82.3 per cent.) is the same as with (82.9 per cent.). In the end to end method, there were eighteen per cent. more successes than failures without periosteum, and in the inlay method, nine per cent. more successes without periosteum than with, while, on the contrary, with the intramedullary method, there were thirteen per cent. more successes with grafts with periosteum than without. It is difficult to explain the cause of the differences in the various methods.

4. Suppuration occurred in 121 cases, or eight per cent.; thirty-two per cent. of these succeeded. Suppuration is the most frequent cause of nonsuccess of graftings, with insufficient immobilization and too short duration as the second most frequent cause.

5. The conclusion is reached that the most successful method of bone grafting is by the osteoperiosteal method (Delageniere). The bony defect should be filled in with small bone chips, and on one or two aspects, overlapping the ends of the fragments, covering in the bone chips, should be placed one or two strips of periosteum with adherent, osseous plaques, taken from another bone. This method is as applicable to large as to small bony defects.

6. The cause of many nonsuccesses is due to defective immobilization, or to undue curtailment of its duration. From four to six months' immobilization is ordinarily required for complete success.

7. There is sufficient evidence to prove that the most effectual treatment of nonunion of fractures is bone grafting.

8. The causes of failures of bone graftings, summarized, are: a, improper method of grafting; b, suppuration; c, insufficient immobilization, or over too short a period of time; d, fracture and dislocation of the grafts; e, atrophy of the ends of the bone to be grafted.

9. The intramedullary method of grafting should be discarded.

10. Despite a few opinions to the contrary, bone graftings should not be performed in infected fields.

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Serpent Worship and the Dawn of Medicine

By JONATHAN WRIGHT, M.D.,
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As we look upon our medical book plates we see in many of them, stamped on the title page, the device of Æsculapius, whose connection with the serpent was so close he was received into the Roman religion in the form of a living snake (1). Our minds, if historically informed, travel back through the snakes in the temple of Epidaurus and those climbing Aaron's rod to the plumed serpent of the Mesopotamian civilization and of the Central American civilization. There before our eyes, in numerous illustrations, as well as in others where the snake peers out from behind the statue of Æsculapius, there we see the vestige of primitive medicine which was so intimately connected with primitive religion, a time when the priest and the doctor were one. It is a remarkable record which we find in the study of primitive man in his relation to the serpent. It has crept into the book of Genesis, and it is so voluminous that we can here only touch on the high points in the relief as we pass across the record to the dawn of historical medicine. Even so, we soon realize that the serpent is one of the features in the wild man's environment which sharply reminds us how different it was from our own. So important an element was it and still is in tropical countries that there we find the snake raised to the most important place in the cult of primitive religions. As in those latitudes especially the venomous snake most abounds we cannot avoid the conviction that out of the hated and horrid power of poison in its bite grew the instinctive repulsion man feels for it, but out of it also, the fear rising into reverence in the children of nature, sprang to a large extent snake worship as a cult in so many and so widely separated regions of the globe. According to Lubbock (2) serpent worship prevails or has prevailed in Egypt, India, Phoenicia, Babylonia, Greece, Italy, Lithuania, Persia, Cashmere, Cambodia, Thibet, China, Ceylon and among most of the tribes of Africa and very extensively among those of America, and in the Islands of the Pacific. It has penertated as far north as the Kalmucks of Siberia.

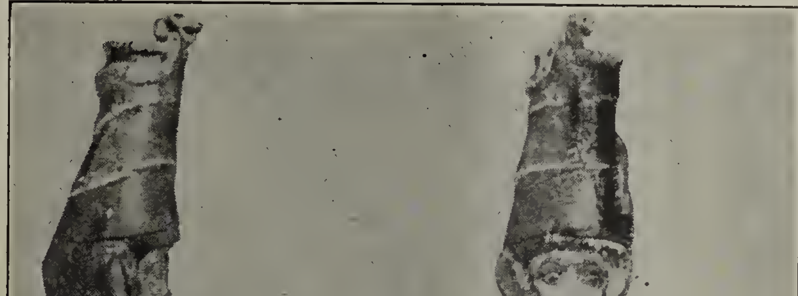

Fig. 1.—Faïence figure of snake goddess.

Prevailing so universally there are some who have regarded it as *the* primitive religion of man, but that is a narrow conception of the origin of it, and comprehensive as are the manifestations of the phenomena, entirely inadequate. However, it is saving the cobra from extinction or from attempts to ex-

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terminate it today in India, where the deaths from the bite are appalling in some districts. In Ceylon they say (7) the cobra is the good snake. That vast numbers of people die each year from its bite makes no difference. "The great god Brahm put his mark upon all our people, when the first cobra spread his hood to keep the sun off Brahm as he slept. Look and be afraid," spake the snake in Kipling's tale of "Rikki-tikki-tavi." It takes refuge thus beneath the shield of superstition as did, according to Virgil (3) the serpents which killed Laocoon and his sons *"sub pedibusque deæ clipeique sub orbe teguntur"* (12). The maleficent power it carried in its fangs often sinks entirely from view and in the Cretan Snake Goddess we shall find it the symbol of life and power just as it was rising to that position in the civilization of the central Americans and the Mexicans (4) when Columbus discovered America. Its venom could hardly have impressed the Kalmucks or the Druids. The idea of resurrection after death has played an important part in almost all religions and among the Druids the snake was regarded "as a symbol of the renovation of mankind, one of the doctrines set forth in their mysteries. It is known that the snake casts its skin annually and returns to a kind of second youth. Fine specimens of this reptile were kept by the Druids close under the altar of augury and from their motions important divinations and legal decisions were made. Below the breastplate of judgment the Druids wore, suspended by a chain, the Glain Neidr, or snake stone" (5). In Wales, Miss Trevelyan found a story that could have been taken from the legends of the snakes of Æsculapius. A snake was seen gliding through the grass of an orchard, with leaves in its mouth, which it was chewing and it was seen to apply them to a child lying there sick of the scurvy. Baden Powell (6) tries to trace the origin of Hindu snake worshippers: "We know there was an ancient serpent (and sun) worshipping race in Kashmir; that the people of Taxilla in Alexander's time, were snake worshippers and certainly not Aryans," but the same may be said of the Central Americans. A character so world wide, so lost to us in the earliest traces we have of man on this earth, it is useless to attempt to trace to any one centre of primitive life.

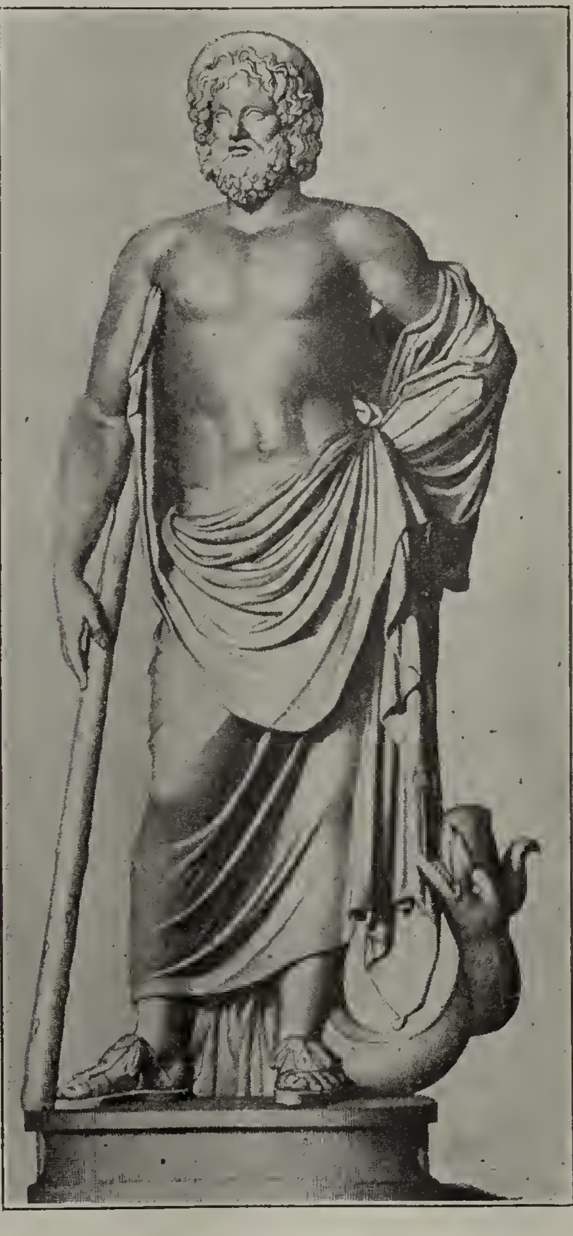

Fig. 2.—A Greek statue to Æsculapius.

According to Andrew Lang, among the tribes of Central Australia, Daramulum, one of their deities, was the author of disease as he was the possessor of medical skill. "He appears in the form of a serpent at their assemblies, like Æsculapius and the American Hobamok" (8). Among the African Zulus a certain species of serpent contains the spirits of their ancestors (1) and Æneas suspected the ghost of his father, when he did sacrifice to his manes, in the serpent when it glided among the bowls and the cups at the feast and drank from them and when it took refuge in the tomb he was *"incertus, geniumne loci famulumne esse putet"* (9), doubtful whether it was a local deity or the parental spirit. But ancestor worship, no more than the snake's venom or the resurrection of its skin entirely suffices as an explanation of serpent worship, though it is possible, if we believe such primitive beliefs are transmissions by human immigration or by word of mouth, to suppose the power of its bite was the starting point of primitive man's reverence for it, and other ideas, ancestor worship and the resurrection of the dead among them, were subsequently engrafted on it, but the question in this form assumes proportions which forbid its introduction here, interesting as the details are.

There is nothing of any of these in the story from the lower Niger in Africa, but it illustrates the depths to which human abjection reaches in the face of such superstitions and it has its element of the ridiculous as well. Among the huts in the villages there, the pythons, some grown to enormous size, are allowed freedom of quarters and choice of food in a way that would seem very disconcerting to us to say the least. "What appears to have astonished my native informants is the occasional unruliness of these pampered creatures in attempting to swallow infants and young children, in other words, the youngest members of the ancestral circle. What, however, is even more enigmatical to the European mind than this ingratitude is the fact that even in an emergency of this personal nature, when the life of a human being in whom is centered all the love of a mother, and who may perhaps be to the father the last and only hope of perpetuating his own personality—is at stake, a priest, the High Priest if available, must be appealed to to rescue the child" (10).

How far the Cretan civilization, of which archeology alone has furnished about all the historical information we possess, may be held to represent a connecting link between the culture of the mainlands of Asia and Africa and the Mycenean and the Greek civilizations has not been elucidated either by archeological research nor by allusions in the oldest historical records we have. That it was a very high one, as compared to the conditions of primitive life, in which thus far for the most part we have sought our examples of the origin of serpent worship, we are forced to believe by the astounding revelations of Sir Arthur Evans and his workers in the last twenty years. The picture of the snake goddess of Knossos has circulated widely in various publications in recent years.

We have another hint on our way to Æsculapius from this mysterious centre of prehistoric civilization in the Ægean. "We are brought face to face," Miss Harrison declares (11), "with the astounding fact that Zeus, father of gods and men, is figured by his worshippers as a snake." It was in Crete, especially around Knossos, according to one account, the most widely accepted one, that Zeus was brought up. According to Rogers, the translator of Aristophanes, in a footnote to the Plutus, quoting a passage from Dr. Caton I fail to find, it was in Cos, the birthplace of Hippocrates, an island not far from Crete and close to the mainland of Asia, where on investigation there was discovered in the temple floor a receptacle in which it was surmised the sacred serpents had their den. At least Dr. Caton (12) refers to such a home for the snakes in his description of the temple at Epidaurus, on the eastern coast of Argolis in Greece. He says in an especial degree they were an incarnation of the god and through a hole in the cover perhaps they crept to impress the patients lying in the corridors above, who regarded them with the utmost awe, a great adjuvant to any medication. Such a scene full of humor and mirth, depicted by Aristophanes, possibly we shall have occasion to refer to on another occasion.

Pausanias (13) gives many legends, few alike, of the birth and training of Æsculapius, but he says, "his most famous sanctuaries are offshoots from the one at Epidaurus." At Athens they called the day Epidauria, on which, in celebrating the mysteries they assigned a share to Æsculapius and dated the time since he was considered a god from the period when this practice began. His ancestry on his mother's side as well as on his father's, like that of most heroes, is shrouded in mystery for us. A common version was that he was the son of Apollo and Coronis, a light minded lady, of the kind apparently, who in every age of the world makes trouble, not so much for the genealogists as for those who seem really to regard the genetics of man as a serious scientific occupation, fondly believing any animal is as continent in freedom as horses and sheep are forced to be in bondage. We are privileged, however, to believe Æsculapius was a successful practitioner and a famous physician, if we choose, but the pious Pausanias, basing his faith on much evidence which does not impress us, believed he was always a god. Whether his mother was Coronis or Arsinoe, whom the Messenians claimed as a fellow citizen, the Pythian Priestess at Delphi gave an answer from Apollo, acknowledging but excusing the share he has in the frailties of mortal flesh, to which we may subscribe for the sake of the first line:

> O, born to the world's great joy, Æsculapius,
> Offspring of love, whom Phlegas's daughter, fair
> Coronis, bore to me.

In the Hieron Valley, in the Argolic Peninsula, there is a hamlet by the name of Koroni which commemorates (12) still the name of the fair Coronis, six miles from Epidaurus. Here, we are told in one of the legends, Æsculapius was born. In Pausanias's day the statue of the god stood in the temple at Epidaurus, seated on a throne, grasping a staff in one hand and holding the other over the head of the serpent, a dog crouching at his side. Lickings from the tongue of either cured the sick people in his temples, wherever they stood. Athens, Delphi, Pergamus, Troizen, Cos, Trikke, are the ones Caton specifically mentions, but at Sicyon, where there was a temple, they told Pausanias the god was brought to them from Epidaurus in the likeness of a serpent sitting in a carriage, drawn by mules and the person who brought him was a Sicyonian woman. At Cos Æsculapius also practised, it appears, since some Epidaurians of Argolis, being sent by their government to consult him there, carried with them in the ship a serpent, which plunged into the earth near the sea at a port they called at in Laconia. There they stayed and erected altars to Æsculapius where the serpent escaped into the hole.

This was in Lacedomonia, but by the story we have traced the legendary Æsculapius, whether god

onian woman. At Cos Æsculapius also practised.

the temples of Cos, subsequently the birthplace of the historical father of medicine and the dwelling place of his kin for many generations as priests of the god before him. Æsculapius appears to have arrived late at Athens, in the time of Sophocles, but here we must halt, since already it is apparent that of all the devout men who now sleep in the bosom of the earth they once trod the snake worshippers are the most numerous and our emblem is one that was once most efficacious in impressing mankind with awe and, for us most important of all things, with faith.

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The Action of Various Substances on the Liver*

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In two previous papers (1 and 2) it was shown that various salts and other substances when injected into the duodenum produced after a while a darker colored bile, which was caused by the activity of the liver. The dark bile appearing after the magnesium sulphate instillation into the duodenum must be ascribed to the same factor, and not to an emptying of the gallbladder, as Lyon assumed. The reasons why Lyon's views cannot be supported were fully described in the two papers mentioned above.

Dunn and Connell (3) injected magnesium sulphate into the jejunum of their patient without a gallbladder and found the same color reaction present, namely A B C bile; when, however, injected through the rectum the color play was missing. They conclude from their case that the gallbladder had nothing to do with this reaction.

Crohn (4), and somewhat later Bassler, Luckett and Lutz (5), have likewise proved the improbability of Lyon's view. Bassler, Luckett and Lutz maintain that the deeper color of B bile is due to oxidation, and not to concentration from retention in the gallbladder, this bile most often coming directly from the liver as a phenomenon of bile secretion.

Lyon (6) has recently written a reply to these criticisms. After perusing his paper I must say that all the reasons I gave for ascribing the color reaction of the bile to the direct action of the liver—and not to an emptying of the gallbladder—stand unshaken.

In this paper I intend to discuss, first, my experiences with the action of various substances on the liver, when given not only through the duodenum, but also through other routes (stomach, rectum and skin) and secondly, to make an attempt to study the function of the liver under physiological conditions and in a way easily accessible to clinicians. A number of graphs demonstrating the color reaction of the bile are presented herewith.

A. THE RESPONSE OF THE LIVER TO STIMULATION BY VARIOUS SUBSTANCES WHEN INTRODUCED BY THE STOMACH, RECTUM OR SKIN.

As mentioned above, Dunn and Connell clearly demonstrated that magnesium sulphate injected into the jejunum (not coming in contact with the duodenum) gave the color reaction. They failed, however, to produce the dark color of the bile, when the magnesium sulphate was instilled into the rectum. These clinicians assume that the magnesium sulphate carried to the liver by the portal circulation effects the dark color of the bile.

Inasmuch as the functional activity of the liver is subject to variations in different individuals, and one case not being sufficient for their conclusions, it seemed to me that it would be interesting to make a number of investigations regarding this point, i. e., to ascertain whether the portal circulation is an essential factor in the production of the dark color of the bile. With this object in view, magnesium sulphate, peptone, glucose, atropine and other substances were given to patients by duodenum, mouth, rectum and also subcutaneously. Frequently the same substances were given to the same patients on different days by the various mentioned routes and the results compared. I present herewith a report of a few of these experiments:

CASE I.—Patient W. H., with cirrhosis of the liver and chronic nephritis.

a. December 31, 1921: Fasting: duodenal contents, yellow, turbid, fifteen c. c. Sixty c. c. of twenty-five per cent. glucose given by the tube into the duodenum. The contents appeared dark brown, yellow green (olive) for thirty-five minutes, the quantity being about seventy c. c., then a clear golden yellow fluid set in for about three minutes, the quantity being fifteen c. c.

b. January 1, 1922: Sixty c. c. of twenty-five per cent. glucose by mouth. For eleven minutes sixteen c. c., yellow turbid; after seventeen minutes twelve c. c., greenish brown; after twenty minutes, six c. c., yellow turbid; after twenty-three minutes six c. c., dark brown clear.

c. January 2, 1922: One hundred c. c. twenty-five per cent. glucose per rectum. Fasting: ten c. c.; dark yellow brown, very turbid; slight color reaction present; total thirty c. c. in forty-six minutes. Dark color set in fourteen minutes after injection and lasted nine minutes, ending at twenty-three minutes after the injection.

d. December 30, 1921: Sixty c. c. of twenty-five per cent. magnesium sulphate by mouth; color reaction present beginning after fifteen minutes.

e. December 29, 1921: One hundred c. c. of twenty-five per cent. magnesium sulphate by rectum. No bile obtained in thirty minutes.

CASE II.—Patient Charles B. F., with duodenal ulcer and probable cholecystitis.

a. January 15, 1922: Sixty c. c. of twenty-five per cent. glucose by duodenum. Moderate color reaction, beginning at two minutes and ending at thirty minutes after instillation; quantity in thirty minutes, thirty c. c.

b. February 3, 1922: Fasting: grayish, no bile, very turbid; alkalinity, 10; one hundred c. c. of twenty-five per cent. glucose by rectum. Moderate color reaction present beginning at ten minutes after injection and lasting for twenty-five minutes; total forty c. c. in fifty minutes; height of reaction at twenty-two minutes.

CASE III.—Patient Y. Y. L., with duodenal ulcer and cholecystitis.

a. February 5, 1922: Fasting: dark yellow turbid; sixty c. c. of five per cent. peptone by mouth. Good color reaction, beginning ten minutes after the injection and ending at forty minutes; total thirty c. c.; height of reaction at twenty-six minutes.

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*Read before the Clinical Society of the Lenox Hill Hospital, April 14, 1922.

b. February 3, 1922: Fasting: dark yellow, slightly turbid; alkaline; one hundred c. c. of twenty-five per cent. glucose by rectum; moderate color reaction beginning at ten minutes after injection and ending at thirty-five minutes; height of reaction at twenty-eight minutes.

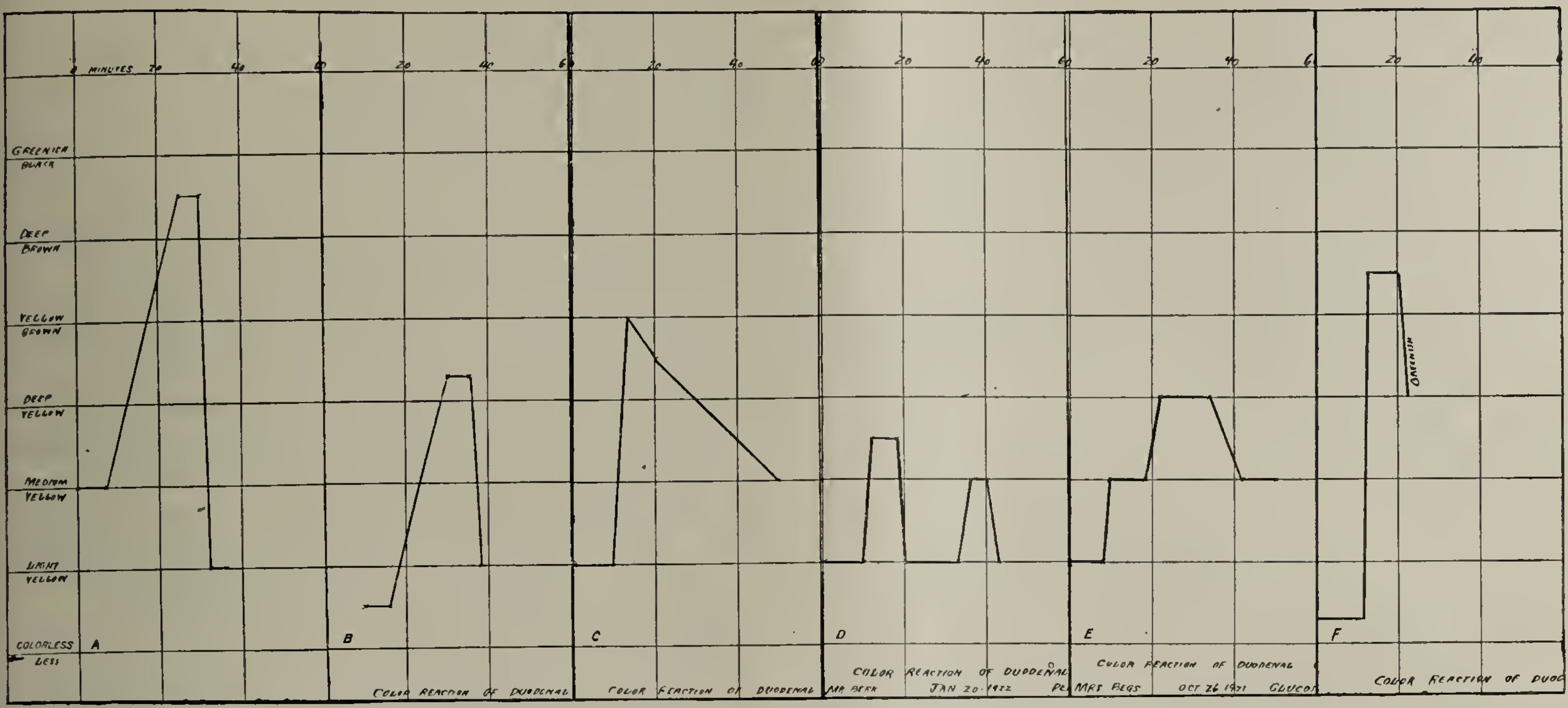

FIG. 1.—Color reaction of duodenal contents. A, Mr. W. B. M., January 9, 1922, sixty c.c. five per cent. solution peptone by mouth, total contents twenty-five c.c.
B, Mr. A. N. A. S., January 19, 1922, 100 c.c. twenty-five per cent solution magnesium sulphate, by rectum; total contents 125 c.c.
C, Mr. T. January 24, 1922, sixty c.c. water and atropine by duodenum, one half mgm. hypodermically; total contents eighty c.c.
D, Mr. B, January 20, 1922, 100 c.c. five per cent. solution peptone by rectum; total contents fifty c.c.
E, Mrs. B., October 26, 1921, sixty c.c. glucose by duodenum; total contents seventy-five c.c.
F, Mr. H. L., December 25, 1921, sixty c.c. five per cent. solution peptone by duodenum; total contents thirty-five c.c.

c. January 26, 1922: Fasting: canary yellow, turbid; A, 3; S, 1; T, 2; sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum; forty c. c. in thirty-five minutes; no color reaction.

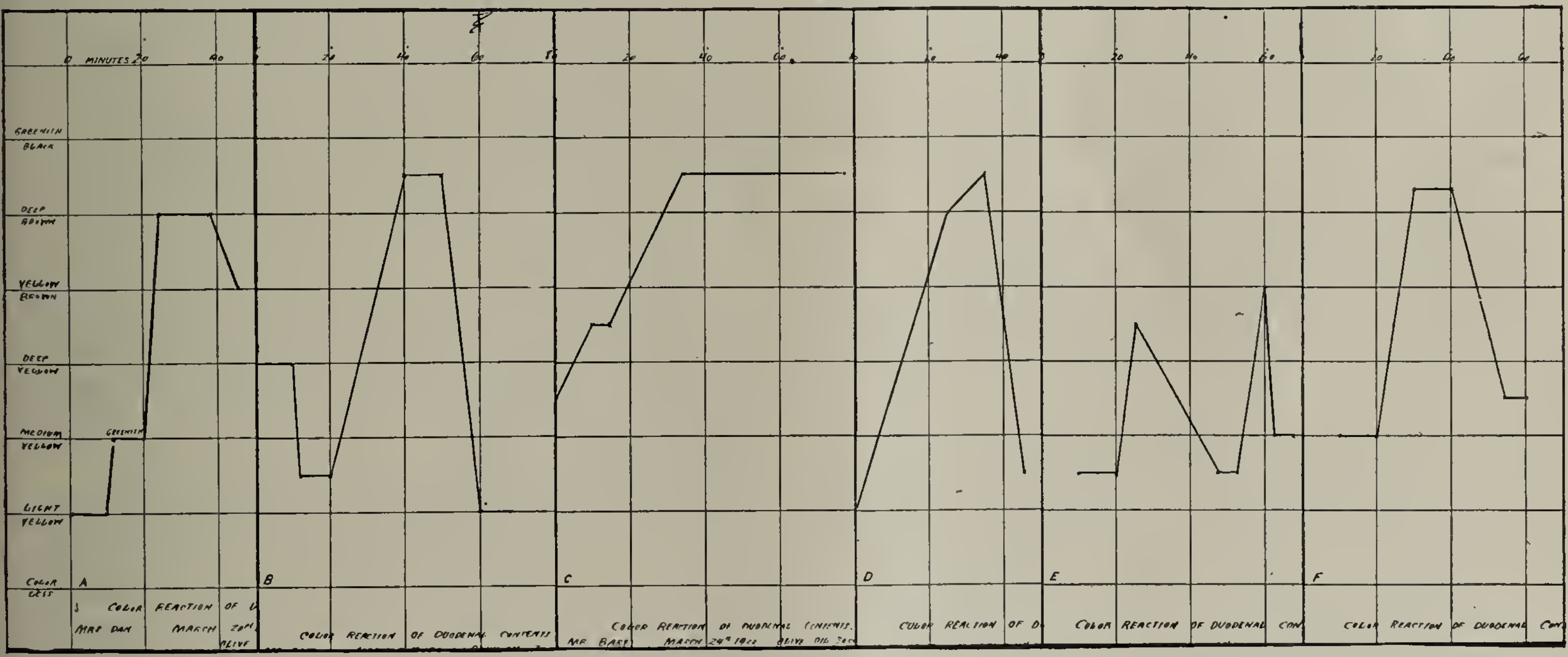

FIG. 2.—Color reaction of duodenal contents. A, Mrs. D. March 20, 1922, thirty c.c. olive oil and thirty c.c. saline solution by duodenum; total contents 125 c.c.
B, Mrs. B., March 21, 1922, thirty c.c. olive oil and thirty c.c. saline solution, by duodenum; total contents fifty c.c.
C, Mrs. B., March 24, 1922, thirty c.c. olive oil and thirty c.c. water by mouth; total contents seventy-five c.c.
D, Mrs. M., April 24, 1922, thirty c.c. olive oil by mouth; total contents, fifty-five c.c.
E, Mrs. M., April 6, 1922, sixty c.c. olive oil by rectum; total contents forty-five c.c.
F, Miss H. C., April 6, 1922, sixty c.c. olive oil by rectum; total contents fifty c.c.

CASE IV.—Patient Y. W. N., with gastric ulcer and cholecystitis.

a. January 1, 1922: Fasting: light yellow, very turbid; alkalinity, 30; sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum; moderate color reaction beginning at two minutes and ending at twenty-seven minutes; thirty c. c. in twenty-seven minutes; height of color reaction at twelve minutes.

b. February 10, 1922: Fasting: very turbid; pea soup yellow, acid; one hundred c. c. of twenty-five per cent. magnesium sulphate by rectum; slight color reaction, beginning at thirty-seven minutes and ending at forty-seven minutes; total thirty c. c. in forty-seven minutes; height of color reaction at end.

CASE V.—Patient Barney B., with gastric ulcer.

a. January 23, 1922: Fasting: dark yellow, very turbid; alkalinity, 20; sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum. Good color reaction beginning at twenty-five minutes and ending at sixty-four minutes, total forty-five c. c. in seventy-three minutes; height of reaction at forty minutes.

b. January 13, 1922: Fasting: dark yellow, very turbid, alkalinity, 20; sixty c. c. of tap water by duodenum. Good color reaction beginning at twenty-five minutes and ending at sixty-four minutes; total forty-five c. c. in seventy-three minutes; height of reaction at fifty-six minutes.

c. January 16, 1922: Fasting: light yellow, turbid; peptone by mouth; slight color reaction beginning at fifty minutes and ending at fifty-five minutes; total 120 c. c. in fifty-five minutes.

d. January 20, 1922: Fasting: dark yellow; alkalinity, 18; one hundred c. c. of five per cent. peptone by rectum. Double color reaction, the first beginning at ten minutes and ending at sixteen minutes; the second beginning at forty minutes and ending at forty-two minutes; total fifty c. c. in forty-two minutes; specific gravity, 1010.

CASE VI.—Patient Paul T., with duodenal ulcer.

a. January 24, 1922: Sixty c. c. of water by duodenum and atropine 0.0005 gm., hypodermically. Fasting: canary yellow, turbid, alkaline; moderate color reaction beginning ten minutes and ending twenty minutes after hypodermic; total eighty c. c. in fifty minutes.

b. January 22, 1922: One hundred c. c. of twenty-five per cent. magnesium sulphate by rectum; fasting: straw yellow, turbid; alkalinity, 20. Slight color reaction beginning at ten minutes and ending at seventeen minutes after instillation; total twenty c. c. in twenty-two minutes.

c. January 26, 1922: One c. c. saline hypodermically. Fasting: yellowish gray, turbid; no bile, no color reaction, total sixty c. c. in nineteen minutes.

d. January 25, 1922: Atropine 0.0005 gm. hypodermically, no color reaction, total thirty-five c. c. in thirty minutes.

CASE VII.—Patient Solomon D., with penetrating gastric ulcer.

a. January 17, 1922: Sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum. Fasting: dark brown, turbid; five c. c.; alkalinity, 35; A, 5; S, 1; T, 1; good color reaction, beginning at four minutes and ending eleven minutes after instillation; total thirty-five c. c. in twenty-nine minutes.

b. January 18, 1922: Sixty c. c. of five per cent. peptone by duodenum. Slight color reaction, beginning at ten and ending at sixteen minutes after instillation; height of color reaction at fourteen minutes; total fifteen c. c. in sixteen minutes.

c. January 23, 1922: Sixty c. c. of water and atropine, 0.0005 gm., by duodenum; very slight color reaction beginning at ten minutes and ending in twenty minutes after instillation; total thirty-five c. c. in thirty minutes.

d. January 24, 1922: Sixty c. c. of water by duodenum and atropine 0.0005 gm. hypodermically; moderate color reaction beginning at twenty minutes and ending at thirty minutes after instillation; total sixty c. c. in thirty-five minutes.

e. January 25, 1922: Atropine, 0.0005 gm., hypodermically; slight color reaction beginning at ten minutes and ending at twenty minutes; height of reaction at fifteen minutes; total forty c. c. in one hour.

f. January 26, 1922: Sixty c. c. of 0.9 per cent. saline by duodenum; very slight color reaction beginning at twenty-six minutes and ending at thirty-four minutes after instillation.

It is clearly evident from these experiments that neither the duodenum nor the portal circulation is the main factor in the production of the dark colored bile. This phenomenon must be ascribed to the liver as a response to the introduction of substances into the system when the former reach this organ by the blood current. Although the strength of the reaction varies according to the character of the ingredient and its concentration it seems that there is at times a response from the liver, even after the entrance of the mildest substances into its circulation. Thus even plain water when introduced by the duodenal tube or given subcutaneously alters in a mild degree the character of the bile.

It is selfevident that this liver response will vary in different individuals. It is, however, quite remarkable how acutely sensitive the liver is toward the entrance of anything additional into the circulation. The functional activity of this organ is very alert and manifold, and a thorough knowledge of the same appears to promise well for the recognition of disturbances of the liver. This brings us to the second part of the paper.

B. AN ATTEMPT TO TEST THE FUNCTION OF THE LIVER UNDER PHYSIOLOGICAL CONDITIONS AND IN A PRACTICAL MANNER.

The liver is the biggest glandular organ in the body. Its great importance is seen, first, by its being essential to life—hepatectomy is soon followed by death—and secondly, by the portal circulation. The latter sends the entire supply of the venous blood of the alimentary canal to the liver for its special elaboration, before permitting it to enter the general circulation. Pathological conditions of the liver are frequently met with. Up to date principally the advanced stages of the disease processes are recognized, after they have led to considerable destructive changes in the liver tissue (cirrhosis, lues, neoplasm). It is quite natural that an organ which plays such an important part in the digestive process will frequently be subjected to functional disturbances, before the latter have led to definite organic changes.

In a vague way the laity and also a number of physicians at times recognize liver troubles when there is no definite proof of the existence of such a disturbance. In order to advance our knowledge in this respect tests for the liver function have been introduced by clinicians. Foremost among these are the glucose and the galactose tests and the phenoltetrachlorphthalein test of Geraghty. The sugar tests are not direct tests, as the results are looked for in the urinary secretions, which rather must be considered as a combination test of the liver and kidney. Similarly Geraghty's test, although already more direct, necessitates an examination of the feces in order to determine the amount of phenoltetrachlorphthalein excreted.

Aaron (7) has improved this test by utilizing the duodenal contents for the phenolphthalein determinations, which certainly is a step in advance. The phenoltetrachlorphthalein test, however, has the disadvantage that it has to be injected intravenously—a method which detracts from its general use. Substances which act on the liver directly and the results of which are found in the duodenal contents (bile) will naturally be able to give us more precise and quicker results.

In my two previous papers it was shown that numerous drugs and some nutritive substances when injected into the duodenum, in commensurate amounts, stimulate the liver to increased activity resulting in the excretion of a more concentrated darker bile. By these tests the work of the liver can be to a certain extent ascertained. If the liver tissue is greatly diseased or has been replaced by connective tissue, the response to stimuli will be entirely missing or considerably diminished.

In a number of instances of carcinoma and cirrhosis of the liver the response to the tests mentioned above (principally magnesium sulphate, peptone and glucose) was found diminished or absent, as described in my two previous papers.

It is, however, selfevident that, on the one hand, even in organic diseases of the liver, the functional activity of this organ will occasionally be good, depending upon the amount of healthy tissue not involved in the disease process; on the other hand we will expect to find here—as in other organs—anomalies of function of the liver activity in conditions in which no apparent organic disease can be elucidated, disturbances which must be ascribed to nervous influences.

As already described elsewhere we can utilize many substances for testing the activity of the liver by the production of the darker color of the bile. Magnesium sulphate, peptone, and glucose have been most frequently applied; magnesium sulphate, as a representative of salts, peptone and glucose as materials of our food groups. The tests made with peptone or glucose approach the physiological happenings after food ingestion, especially when they reach the duodenum. Olive oil (thirty c. c.) followed by saline (thirty c. c.) or above as representative of fats, has been applied likewise and found useful.

While in a number of individuals we get a response to any of the above designated tests, there are persons who react to a certain number of them, but not to all. It is therefore impossible to conclude from the presence of a reaction of one substance, as, for instance, magnesium sulphate, that it will be present also after peptone or glucose, and vice versa. A few illustrations are given below.

Case VIII.—Patient A., with achylia gastrica and chronic cholecystitis.

a. January 17, 1922: Sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum. Fasting: dark yellow, very turbid; alkalinity, 25; A, 6; S, 1; T, 4; very good color reaction beginning at ten minutes and ending at twenty-two minutes after the magnesium sulphate instillation; total amount thirty-five c. c. in twenty-two minutes (many cholesterin and calcium bilirubin crystals and mucus).

b. January 18, 1922: Sixty c. c. of five per cent. peptone by duodenum. Fasting: pea soup yellow, very turbid; ten c. c.; no color reaction; total amount forty c. c. in fifty-three minutes.

c. January 19, 1922: One hundred c. c. of twenty-five per cent. magnesium sulphate by rectum. Fasting: light yellow, turbid, five c. c., alkalinity, 10; moderate color reaction beginning at six minutes and ending at twenty-five minutes after injection; total amount 125 c. c. in twenty-five minutes; height of reaction at twenty minutes.

d. January 25, 1922: Sixty c. c. of twenty-five per cent. glucose by duodenum. Fasting: light yellow with greenish tinge, very turbid; slight color reaction beginning at twelve minutes and ending at eighteen minutes after instillation; total forty c. c. in eighteen minutes.

In this case there was a strong color reaction after the magnesium sulphate instillation, given by the duodenum, and a moderate reaction when given by the rectum; there was no color reaction after peptone by the duodenum and a slight reaction after glucose by the duodenum.

Case IX.—Patient K., with penetrating ulcer of the stomach.

a. December 20, 1921: Sixty c. c. of twenty-five per cent. glucose by the duodenum. Fasting: dark yellow, turbid; alkalinity 20; no color reaction; total amount thirty c. c. in twenty-seven minutes.

b. December 29, 1922: One hundred c. c. of twenty-five per cent. glucose by rectum; no color reaction; total amount twenty-five c. c. in twenty-five minutes.

c. December 27, 1921: One hundred c. c. of twenty-five per cent. magnesium sulphate by rectum; slight color reaction at twenty-five minutes; total amount fifty c. c. in forty minutes.

Case X.—Patient Morris W., with gastric ulcer and chronic cholecystitis.

a. January 9, 1922: Sixty c. c. of five per cent. peptone by mouth. Fasting: canary yellow, very turbid; ten c. c., alkalinity, 20; very good color reaction, beginning at seven minutes and ending at twenty-five minutes after injection; total twenty-five c. c. in thirty-five minutes.

b. January 10, 1922: One hundred c. c. of five per cent. peptone by rectum. Fasting: greenish yellow, very turbid; ten c. c. alkalinity, 25; slight color reaction beginning at eight minutes and ending at thirty minutes; total amount forty c. c. in sixty minutes.

c. January 11, 1922: Sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum. Fasting: canary yellow, very turbid, ten c. c.; no color reaction; total amount sixty-five c. c. in fifty-three minutes.

d. January 17, 1922: Sixty c. c. of five per cent. peptone by duodenum. Fasting: canary yellow, turbid; ten c. c.; good double color reaction, the first beginning at four minutes and ending at eleven minutes; the second beginning at twenty-five minutes and ending at forty minutes; total amount, thirty c. c. in forty-three minutes.

This case showed no reaction with magnesium sulphate by the duodenum but gave the reaction with peptone by stomach, duodenum or rectum.

Case XI.—Patient Harry L., with duodenal ulcer.

a. December 16, 1921: Sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum. Fasting: light greenish yellow; five c. c.; alkalinity, 10; good color reaction; total amount thirty c. c. in thirty minutes.

b. December 18, 1921: Sixty c. c. of twenty-five per cent. glucose by duodenum. Fasting: greenish yellow, turbid; ten c. c.; no color reaction; total amount thirty-five c. c. in forty-six minutes.

c. December 25, 1921: Sixty c. c. of five per cent. peptone by duodenum. Fasting: greenish yellow, turbid; five c. c.; alkalinity, 20; very good color reaction, beginning at ten minutes and ending at twenty-two minutes; height of reaction at nineteen minutes; total amount thirty-five c. c. in twenty-two minutes.

In this case there was a very good color reaction with magnesium sulphate or peptone but not with glucose.

CASE XII.—Mrs. Y. C. B., with peptic ulcer.

a. October 13, 1921: Fasting: canary yellow, turbid; ten c. c.; alkalinity, 20; sixty c. c. of five per cent. peptone by duodenum; good color reaction, total amount sixty-five c. c. in sixty minutes.

b. October 16, 1921: Sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum. Fasting: canary yellow, turbid; hydrochloric acid, plus; acidity, 10; no color reaction; total amount thirty-five c. c. in fifty minutes.

c. October 18, 1921: Sixty c. c. of twenty-five per cent. glucose by duodenum. Fasting: canary yellow, turbid; five c. c.; alkalinity, 10; no color reaction.

d. October 25, 1921: Sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum. Fasting: very turbid, yellow, tinge of brown; fifteen c. c.; acidity, 10; no color reaction; total amount forty-five c. c. in forty minutes.

e. October 26, 1921: Sixty c. c. of twenty-five per cent. glucose by duodenum. Fasting: grayish, turbid; five c. c. alkaline; good color reaction; total amount seventy-five c. c. in fifty minutes.

In this case magnesium sulphate repeated twice in an interval of ten days gave a negative color reaction, while peptone reacted well, and glucose showed once no color reaction and once a good reaction.

CASE XIII.—Mrs. S., with carcinoma of the stomach and the liver.

a. October 6, 1921: Sixty c. c. of twenty-five per cent. magnesium sulphate by the duodenum. Fasting: dark yellow, greenish tinge, turbid, two c. c., A, 6; S, 2; T, 2. Good color reaction; total eight c. c. in twenty minutes. This case is mentioned especially to show that even a big tumor of the liver (carcinoma) need not always abolish the color reaction. The amount of bile was much diminished.

CASE XIV.—N. H., with chronic cholecystitis.

a. October 21, 1921: Sixty c. c. of twenty-five per cent. magnesium sulphate by duodenum. Fasting: dark yellow, very turbid, five c. c., A, 7; S, 3; T. 3; no color reaction; total amount eighty c. c. in forty-seven minutes. The patient is described as a representative of numerous cases of cholecystitis (with and without stones) in which there is frequently no color reaction after magnesium sulphate. This patient was operated upon. The gallbladder was found somewhat thickened and adherent to the liver and duodenum, the cystic duct, however, being patent.

CASE XV.—Victor N. B., with gastric ulcer.

a. March 21, 1922: Thirty c. c. olive oil and thirty c. c. saline by duodenum. Fasting: dark yellow, brownish tinge; turbid; ten c. c.; good color reaction beginning at seventeen minutes and ending at fifty-five minutes after the instillation; height of reaction at forty minutes; total sixty-eight c. c. in fifty-five minutes.

b. March 24, 1922: Thirty c. c. olive oil and thirty c. c. water by mouth. Fasting: dark yellow, very turbid, five c. c.; very good color reaction beginning in ten minutes and ending in seventy-seven minutes; total sixty c. c.; height of reaction at thirty-four minutes; total in seventy-seven minutes, seventy-five c. c.

This case demonstrates that thirty c. c. of olive oil and thirty c. c. of water given by duodenum or mouth give a good color reaction. Thirty c. c. of olive oil alone, without saline, given by duodenum or mouth, gives practically the same color reaction.

REMARKS.

From the experiences reported in the first part of this paper, it appears evident that many substances when introduced into the system by duodenum, mouth, rectum, or skin are likely to stimulate the liver to greater activity when reaching it, producing a darker colored bile. The second part deals with a number of substances which might conveniently be employed for testing the functional activity of the liver. Magnesium sulphate, peptone, glucose, and olive oil are given preference, the first substance as representing salts, the other three as representing the essential food groups (albuminates, carbohydrates and fats) with which the organism has to be constantly supplied.

A number of cases are recorded in which the patients do not react alike to the four substances mentioned above (magnesium sulphate, peptone, glucose, and olive oil). It is therefore impossible to conclude from the presence of the color reaction after one of these substances that it will be present in all. Future investigations will have to be undertaken in order to delineate the frequency or absence of color reactions after one or all of the four mentioned ingredients. Thus far, these color reactions, especially after magnesium sulphate, have been frequently found missing in severe diseases of the liver and occasionally in gallbladder affections.

Before concluding my paper I wish to express my obligations to Dr. M. S. Lewis, Dr. N. B. Stanton, Dr. W. M. Ketcham, Dr. W. T. Mayfield and Dr. H. A. Rafsky for assistance in carrying out these investigations.

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20 EAST SIXTY-THIRD STREET.

Hay Fever and Pollen Therapy*

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About one per cent. of the population (1) of the United States is susceptible to hay fever. Because of the large number of people affected, hay fever prophylaxis merits the attention and serious consideration of the medical profession.

DEFINITION.

Hay fever is a condition of hypersensitiveness to pollen proteins and is produced primarily by the inhalation of wind borne pollens. However, only those wind borne pollens that are inhaled during normal respiration cause true hay fever. Thus Scheppegrell (2) says: "While there are many plants whose pollen may cause the hay fever reaction when applied to the nostrils, only pollens which float in the air and can reach the nostrils in the course of normal respiration are responsible for true hay fever."

SENSITIZATION.

Although wind borne pollen is so widely distributed that the mucous membranes of every person come in contact with it, yet only in those who are sensitized does hay fever develop. The sensitiveness to pollen protein increases gradually with the lowering of the person's vitality, with nasopharyngeal disease or obstruction, with an increase in the amount of pollen inhaled, and there also seems to exist an hereditary sensitiveness to hay fever in certain persons. It may be that the difference between a person who is sensitive and one not sensitive lies in the rate of digestion of the pollen proteins by the respective nasal mucous membranes (3).

INSECT BORNE POLLENS.

The fact that hay fever is caused by the inhalation of wind borne pollens only, eliminates certain insect pollinated plants, such as the rose, goldenrod, honeysuckle, chrysanthemum, lily of the valley, and daisy as important factors in hay fever. The pollen of many of the common flowers may, however, produce a reaction in sensitive persons if the flower is applied directly to the nostrils so that the pollen is inhaled and comes in contact with the nasal mucosa.

CLASSIFICATION OF POLLENS.

Although hay fever may be caused by the pollens of hundreds of different plants, investigations (4) have shown that there are six botanical groups of plants together with a group of certain trees that contain practically all of the wind pollinated plants that cause hay fever. These groups apply to the entire United States and may be enumerated as follows: 1, trees; 2, gramineæ (grasses); 3, chenopods (goosefoots); 4, amaranths (amaranths); 5, rumex (docks); 6, ambrosia (ragweeds); 7, artemisia (wormwoods).

SEASONS AND CAUSES.

In the United States there are usually four well defined seasons of hay fever. The dates of these seasons vary somewhat in different sections of the country, being dependent upon the flowering season of the various hay fever plants.

1. Hay fever in February, March and April is usually due to the pollen of certain trees, such as the oak, maple, elm, ash, cottonwood and walnut. These trees disseminate a large amount of pollen which is a local cause of hay fever in many states.

2. Spring hay fever which begins in April and extends through May, June and July is caused principally by the pollens of the grasses (gramineæ group), particularly timothy, June grass and, more rarely, red top in the East; and June grass and sweet vernal grass in the Middle West.

3. Summer hay fever, beginning in June and extending through July and August to September, is usually caused by the chenopod, amaranth and rumex groups which comprise the goosefoots, the amaranths, and the docks. These groups constitute minor causes of hay fever in many states; but may be important primary causes in some states. Thus, Watson and Kibler (4) state that amaranths are the principal cause of fall hay fever in the Southwest.

4. The fall type of hay fever begins in August and continues until the first frost, and is chiefly due to the pollens of the ragweed group which are found in practically all sections east of Kansas. In the Pacific and Rocky Mountain states, however, this type of hay fever is caused chiefly by the artemisia group; while in the Southwest, the amaranth group constitutes the principal cause of fall hay fever.

TIMOTHY AND RAGWEED.

The most prolonged and most severe cases of spring hay fever in the East are, as a rule, caused by timothy pollen. It stands in somewhat the same relation to spring hay fever as ragweed does to the fall type. East of Kansas eighty-five per cent. of fall hay fever is due to the pollen of the common ragweed. For practical purposes, therefore, in the East at least ninety per cent. of the cases of hay fever may be treated with two pollen extracts, namely, timothy for the spring type and ragweed for the fall type.

DIAGNOSTIC TESTS.

Susceptibility to hay fever can be determined by applying diagnostic skin tests. For this purpose extracts prepared from the individual species of pollens representative of the main botanical groups that cause hay fever should be used.

Sensitiveness to the pollens of the various groups may usually be determined by the diagnostic skin test; using an extract of the pollen representative of the group. Thus an extract of timothy pollen may be used to determine sensitiveness to the grasses, and an extract of ragweed pollen will detect in a similar manner sensitiveness to the ragweed groups. However, the physician should familiarize himself with those pollens which are prevalent in the vicinity where the patient lives, so that he may intelligently select the proper pollens to use for the test; for persons may exhibit positive skin reactions to pollens to which they are not or never will be exposed.

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*Read before the annual meeting of the Medical Society of the State of New York, First District Branch, held at Nyack, October 19, 1921.

In the application of the diagnostic test, two small scarifications, each about an eighth of an inch long and about three inches apart, are made on the flexor surface of the forearm with a sterile needle—care being taken not to draw blood, otherwise the blood will wash the pollen extract away from the scarified tissues. On one scarification is placed a drop of the pollen extract. At the end of a half hour the reaction is noted and compared with the control scarification. A positive reaction, indicating sensitiveness to the pollens of that group to which the pollen used for the diagnostic test belong, consists of a white elevation or urticarial wheal of the skin surrounding the scarified area. The smallest reaction that is considered positive must measure five mm. in diameter.

Several skin tests may be made with the principal pollens of the groups to which the person may be exposed, and treatment given with the pollen extract giving the largest reaction of the group. In cases showing multiple sensitization, however, more satisfactory results will usually be obtained by treating the patient with separate extracts of the pollens that give a positive reaction.

TREATMENT WITH POLLEN EXTRACTS.

Early investigations (5) established beyond doubt that desensitization with pollen extracts was possible and that by this means the onset of hay fever could often be entirely prevented. But Koessler (6), who was the first to report detailed methods of preparing pollen extracts, emphasized the fact that the aqueous pollen extract was not stable and that it rapidly deteriorated in potency after three or four weeks. He pointed out that the material to be injected must constantly be of uniform potency and that no extract of pollen which he had studied could comply with this demand after it was more than three weeks old.

GLYCEROLATED POLLEN ANTIGEN.

It appeared, therefore, that extracts of pollen could not be generally used by the practising physician unless some method of extraction could be devised which would insure a uniformly stable product. With this end in view, we extracted pollen by various methods (7), and succeeded in preparing a stable pollen antigen (8) by extracting the dried pollen in sixty-six and two thirds per cent. glycerol and thirty-three and one third per cent. saturated sodium chloride solution. Such a glycerolated pollen antigen proved to be remarkably stable and more potent than that obtained by any other method of extraction. No loss in antigenic properties could be detected in such glycerolated pollen antigens after being stored in the icebox for twenty-two months. Moreover, we were able to standardize accurately the antigen against antipollen serum (9) by means of the complement fixation method, whereby the amount of antigenically active protein in the extract is accurately determined; thus making it possible to establish a uniform and accurate dosage which insured the maximum degree of protection with the minimum of reaction.

This was a long step forward, for previous attempts at standardization had been carried out by chemical analysis which determined the nitrogen content as an index of the amount of pollen protein present. Such chemical analysis, however, does not differentiate between the antigenically active pollen protein and that which is denatured or inert. Therefore, chemical analysis is not a reliable method of determining the antigenic power of pollen extracts.

On the other hand, only the unaltered protein which is antigenically active enters into the complement fixation reaction; autolytic cleavage products or protein split products play no part. This stable and accurately standardized pollen antigen enables the physician to obtain results of maximum value in the desensitization of hay fever patients, and to avoid the undesirable results induced by extracts that have undergone rapid deterioration.

PROPHYLACTIC (PRESEASONAL) TREATMENT.

Having determined by the diagnostic skin test the pollen or group of pollens to which the patient is sensitive, preseasonal treatment is carried out by giving a complete series of fifteen doses of pollen antigen prepared from the corresponding pollen that gave a positive reaction in the diagnostic skin test.

The glycerolated antigen is prepared in concentrated form so that 0.1 c. c. will contain the required number of pollen units for a given dose. In this concentrated form, the pollen protein is kept under the preservative action of glycerol until immediately before its administration, thus preventing any autolytic deterioration of its antigenic properties. This plan permits of diluting the antigen, just before its injection, to one c. c. which makes the final percentage of glycerol about six and two thirds per cent., an amount readily absorbed by the tissues.

DOSE AND ADMINISTRATION.

The scheme of dosage which we adopted for the glycerolated pollen antigen consists of fifteen doses of a gradually increasing number of pollen units; the pollen unit having been established by Noon (5) who defined it as the equivalent of one millionth of a gram of pollen. The dosage begins with two and a half pollen units which are contained in 0.1 c. c. of a one to forty thousand dilution of the pure soluble pollen protein, and progressively increases up to one thousand pollen units corresponding to 0.1 c. c. of a one to one hundred solution of the pollen protein.

The antigen is administered subcutaneously, preferably in the arm over the insertion of the deltoid muscle. The interval between doses is usually forty-eight hours; a convenient plan being to administer the antigen three times a week. Thus, it requires five weeks for the complete preseasonal treatment of fifteen doses to be given. Best results will follow if prophylactic treatment with the antigen is started about six weeks before the date of the expected attack of hay fever.

LIMITATIONS OF TREATMENT.

The importance of preseasonal pollen treatment cannot be too strongly emphasized. Preseasonal treatment yields by far the most satisfactory results, although treatment with pollen antigen during the pollinating season has often proved beneficial. In a recent editorial (10), the *Journal of the American Medical Association* has pointed out that, "In extenuation of the frequent failures to relieve patients, it should be noted that certain persons are said to have vasomotor symptoms ranging from sneezing to asthmatic attacks due to the odors of flowers that have no pollen as well as to the presence of nonspecific dust in the respired air. Walker has referred to mechanical, chemical and thermal causes of these symptoms. Obviously such irritants cannot be combatted by specific pollen extracts. It is well to realize the limitations in this field of therapy; for such knowledge always makes for better practice."

DESENSITIZATION NOT PERMANENT.

Cooke (11) and others (12) have pointed out that desensitization in hay fever is not permanent or stable; freedom from symptoms lasts only as long as the antigen remains in combination with the tissue antibodies. The state of desensitization is probably at its height for only a few weeks after completion of the antigen treatment and then gradually decreases. Hence it is essential to administer the glycerolated pollen antigen each year just previous to the hay fever season, in order to protect the person from hay fever.

RESULTS OF POLLEN ANTIGEN TREATMENT.

The glycerolated pollen antigen which we first prepared in 1915, and which we described (8) in 1917, has been used by physicians in all parts of the United States. Clinical history blanks were sent each year to every physician who used the pollen antigen in order that we might collect statistical clinical results. A careful examination of 1,578 of these records, covering a period of five consecutive years, shows a remarkable uniformity of favorable results in each year from every locality. Some idea of this uniformity of results may be gained from the following verbatim remarks, appended by physicians in various states to the clinical history blanks:

Vermont.—This man, thirty-seven years old, did his haying on a twelve cow farm without troublesome symptoms for the first time in his life, allowing him to dispense with two extra men. On account of the scarcity of help and high price of labor he considered it a most excellent investment.

Massachusetts.—Patient very much pleased with result. She went out of doors and was able to sleep with her windows open, two things she could never do before. She scarcely sneezed at all.

New Jersey.—In the summer of 1917 and 1918 I thought the patient would die from sheer exhaustion. I urged her to submit to this treatment on August 5th when she began to experience her usual premonitory nervous symptoms. I promised her no results, but much to her delight and mine as well she had the most happy summer in years. Lost no weight, ate well and did her own work, losing only a part of two or three nights' sleep.

Pennsylvania.—Patient always had severe asthmatic type; had to sit up nights to breathe; eye symptoms very severe also. Patient after treatment had only slight symptoms of attack lasting three days; this developed twelve days after his usual date of onset and was very mild. Sneezed a few times and nose ran a little. No asthma. He is very much pleased and will take treatment next year when I hope to give it to him earlier than I did this year. He says it was worth $500 to him for it is the first summer in sixteen years he has been able to sleep.

Indiana.—This patient is my son. Formerly it was necessary to take him to Petoskey, Mich., from August 15th until frost. This has not been necessary since the pollen treatment was first used, including the seasons of 1915, 1916, 1917, 1918 and 1919. Each year he has had hay fever in a mild form extending over the entire hay fever season. However, no symptoms of asthma and he gets through the season in comparative comfort.

Illinois.—There were two days in which the patient had a slight coryza that lasted one or two hours. This patient invariably had to go North every year. This year he was able to remain at his work and enjoy life. Further, the injections did not produce the slightest discomfort.

Nebraska.—This patient states that this was the first year she was free from asthma since she was eleven years old. (She is now thirty-eight years of age.) Other years she was confined to bed for about one week. This year she never lost one day from her work as a housekeeper.

These 1,578 cases include both the spring type and fall type of hay fever, but the large majority were of the fall type. The glycerolated pollen antigen was administered to most of the patients prior to the hay fever season, while some patients received the treatment during the pollinating season. The most satisfactory results were obtained when the complete treatment of fifteen doses was administered in advance of the hay fever season.

The following figures include those patients who received preseasonal treatment, as well as those to whom the antigen was administered during the hay fever attack. In 1915, favorable results were obtained from the glycerolated pollen antigen treatment in eighty-five per cent. of the cases reported; in 1916, eighty-one per cent.; in 1917, eighty-one per cent.; in 1918, eighty-seven per cent.; and in 1919, eighty-six per cent. The average protection or relief from symptoms for the 1,578 cases reported during the five years was eighty-four per cent.

By favorable results, we mean that either hay fever did not develop in those persons taking the pollen antigen treatment at least six weeks before the hay fever season or, in those patients in whom hay fever did occur, the symptoms persisted for a few days only and were mild in character. Favorable results were also manifested in the possibility of the patient remaining in his home town and at his usual work during the hay fever season for the first time in years. When the glycerolated pollen antigen was used during the hay fever season to treat actual attacks of hay fever, favorable results were indicated in that the attack was cut short and the symptoms rendered more mild. Still another evidence of favorable results was in the decided relief from asthmatic symptoms which were associated in fifty per cent. (789) of the hay fever cases. As a result of the pollen antigen treatment, however, the distressing asthmatic symptoms were either entirely prevented or rendered mild and less troublesome in 648 cases or eighty-two per cent.

CONCLUSIONS.

1. In view of the favorable results reported herein, it would seem only fair to state that the method of giving prophylactic injections of the glycerolated

pollen antigen early in the season offers the best means of any method thus far advanced for the preventive treatment of hay fever.

2. It is no longer necessary to forsake one's business during the summer months and retire outside the zone of the offending pollinating plants. This was formerly the only rational therapeutic measure but it was also expensive and time consuming. With the glycerolated pollen antigen treatment, however, the majority of hay fever sufferers can be successfully desensitized and can continue to transact their business in their accustomed surroundings. Hence, the value of the glycerolated pollen antigen treatment has been definitely established.

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The Successful Treatment of Hay Fever and the Causes of Failure

By WILLIAM SCHEPPEGRELL, A. M., M. D.,
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The success in the treatment of hay fever by immunological methods has resulted in many physicians taking up this form of treatment. This is evidenced by the great increase in the number of inquiries addressed to the American Hay Fever Prevention Association regarding the technic and other details of the treatment, and by the greatly increased demand for pollen extracts prepared by the various biological houses.

The result of this increase in the treatment of hay fever is, as ascertained in our correspondence, first, the benefit to the large army of hay fever sufferers who have responded to the treatment, but secondly, the number of failures reported by those who have recently entered this field. An analysis of the causes of these failures is interesting, not only from a scientific viewpoint, but more especially as a guide to those who are using these methods and who may thus be encouraged to continue with the hope of more beneficial results.

INDISCRIMINATE USE OF POLLEN EXTRACTS.

One of the most common causes of failure is the indiscriminate use of pollen extracts. Fortunately, the method of using all the principal hay fever pollens, and frequently including pollens that have no etiological relation to hay fever at all, for preparing an extract recommended on the "shotgun" principle that some of the contained pollens might be of benefit, is no longer followed by any of the reliable biological houses. The efforts of the American Hay Fever Prevention Association has been uncompromisingly that all pollen extracts should be limited to a single form of pollen, or to the group of the same biological reaction, and that the preparation be labelled simply with the name of the pollens from which the preparation is made.

The indiscriminate use of pollen extracts is frequently shown in other ways. The fall hay fever is the best known and most common form of hay fever, and, as the common and great ragweeds are the chief causes of this form of hay fever east of Kansas (1), the ragweed pollen extract is frequently used by practitioner in all forms of hay fever. Physicians who have made any considerable number of diagnostic tests for hay fever have noted the great difference in the reaction of the various tests in the same patient, showing marked variations in the sensitivity of the patient to the pollen extract used and indicating a similar variation in the sensitivity to the different atmospheric pollens. That any one should use the ragweed pollen extract for immunizing against the spring hay fever, occurring in May and June and due in a large percentage of cases to the various grass pollens but never to the ragweeds, which do not pollinate until August and September, seems illogical and remote, but is nevertheless of frequent occurrence. The failure in such cases is the natural result.

IMPORTANCE OF DOSAGE.

A common cause of failure in the treatment of hay fever, even in those cases where a scientific selection of the proper pollen extract is followed, is the lack of judgment regarding the size of the progressive immunizing doses. Where these doses are already prepared, and are injected without regard to the relative sensitivity of the patient as evidenced by the diagnostic tests, this liability to disappointing results is common. In the hay fever and asthma clinic of the Charity Hospital, all patients are tested for the various classes of atmospheric hay fever pollens of this locality, and the reaction is recorded on a decimal basis (2). This record is at the head of each clinical chart and forms the guide to the immunizing doses. We have, for instance, patients with a recorded sensitivity to certain pollens of ninety-five to one hundred per cent., in whom a maximum injection of two hundred units will induce an attack of hay fever and a miliary eruption, while in others, with a lower degree of sensitivity, three hundred or more units are injected without discomfort to the patient, and must be used in order to afford immunization.

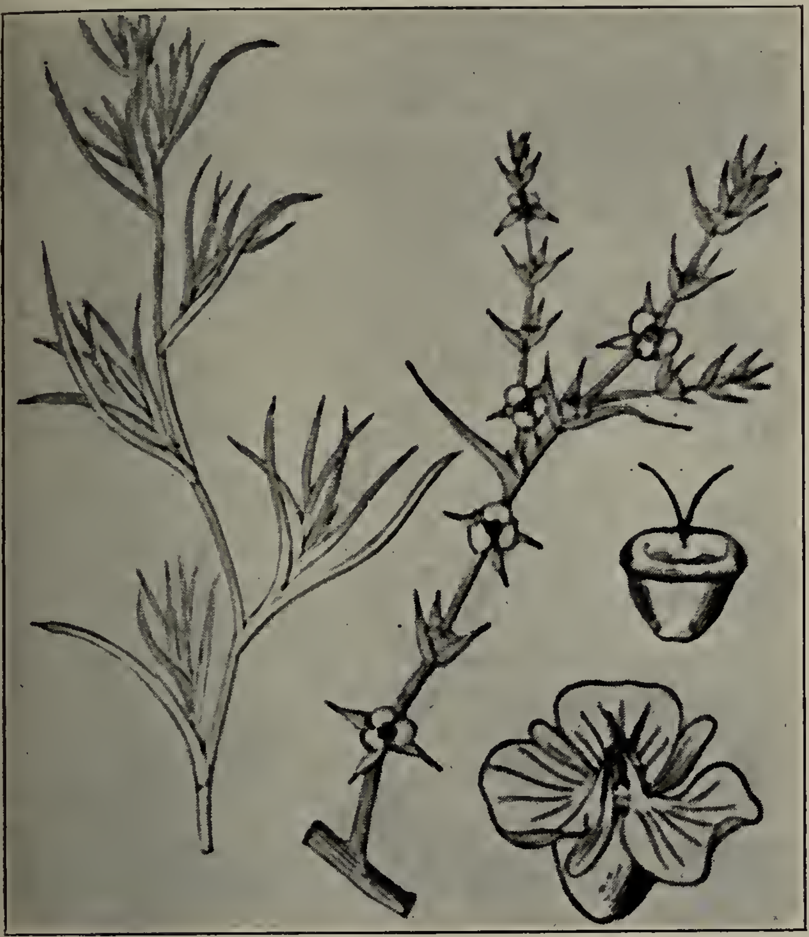
Fig. 1—Russian thistle, Salsola pestifer, the pollen of which forms a complicating cause of fall hay fever from New Jersey to Ontario, the Northern Territory, Kansas and Washington, and in many parts of the Central and Western States.

MULTIPLE POLLEN INFECTION.

A cause of failure in the treatment of hay fever, and one which has become apparent in the evolution of the methods of research of the American Hay Fever Prevention Association is the multiple infection which is present in a considerable number of hay fever cases. In the fall hay fever, for instance, if the patient reacts to the ragweed pollen and the patient develops immunity to this pollen, as evidenced by the diagnostic test, but still has paroxysms of hay fever, this shows that only one of the causes of his hay fever has been removed, and it is the duty of the physician to find the other causes. The identity of the indiscriminating pollens in these cases depends upon the locality, as they vary in different sections of the United States, and recourse must be had to a botanical survey checked by the examinations of the atmospheric pollen plates (3).

A common complicating cause of hay fever is the Russian thistle (Fig. 1), Salsola pestifer, which grows in cultivated fields and waste places from New Jersey to Ontario, the Northern Territory, Kansas and Washington, and in many parts of the Central and Western states. Its period of bloom is from July to September, thus causing an atmospheric infestation to hay fever patients about the same season as the ragweeds. This pollen should be tested for in this region, and, if found positive, the patient should be immunized against its protein. The result will be a greater degree of success, and if this process is followed, the number of failures from immunological methods will be correspondingly low.

In the Southern states the Russian thistle is so uncommon as to be negligible, but similar methods will show other complicating pollens, a common complicating cause of the fall hay fever being the marsh elder, Iva ciliata (Fig. 2). This weed grows in moist soil from Illinois to Nebraska, and south to Louisiana and New Mexico. This pollen belongs to the Ambrosiaceæ group, but gives a much higher reaction, so that frequently a special course of immunization must be carried out. Other causes are members of the Chenopodiaceæ group, which may form a complicating cause of multiple infection, and must be included in the immunizing treatment before complete relief is afforded.

It will be seen, therefore, that the physician engaged in immunological methods in hay fever has a much more complicated proposition than similar methods in other diseases, in which the cause is usually limited to a single microorganism and its toxins. Unless, however, he is prepared to follow up the various forms of immunization, both in the tests and treatment, his successful results will necessarily be limited.

Fig. 2—Marsh elder, Iva ciliata, whose pollen forms a complicating cause of fall hay fever from Illinois to Nebraska and south to Louisiana and New Mexico.

ANALYSIS OF MULTIPLE POLLEN INFECTION.

An analysis of the cases treated in the hay fever and asthma clinic of the Charity Hospital shows that over one half presented a reaction to the Chenopodiaceæ group sufficiently marked to be considered a potential etiological factor in their attacks of hay fever or asthma. Specifically, the reactions were as follows: In the spring summer hay fever, fifty-two per cent.; fall hay fever, sixty-five per cent.; spring summer fall hay fever, seventy-one per cent.; and in the perennial hay fever, fifty-two per cent.

The deciding factor in the question of the additional immunization of such cases is the locality of the patient's residence or place of business. The pollens of the chenopod group do not infest the air in a uniform manner, as, for instance, in the case of the ragweeds. The pollen of the latter we found on our test plates exposed on the tower of the Hibernia Bank Building of New Orleans (355 feet), and the number to the square centimetre differed but little from those on plates exposed near the ground and in the residential section of the city. The reason for this is that the pollens of the chenopod group are not as numerous nor as buoyant as that of the ragweed, so that in one section of the city the percentage may be relatively high, and low or entirely absent in another locality on account of the variations in the weed areas.

In carrying out the immunizing treatment of hay fever, therefore, whenever the patient does not show sufficient benefit from the injection of the pollen extract of the principal groups to which he shows a positive reaction, the treatment should be continued with the extract of the pollen which was found to be a contributory cause. This method, combined with proper care in the size of the doses, and the judicious use of catarrhal vaccines (4), should paroxysms of hay fever occur in spite of the injections, will insure a gratifying success in the treatment of this distressing disease.

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AUDUBON BUILDING.

Immunization Therapy in Hay Fever*

By A. I. RUBENSTONE, M.D.,
Philadelphia.

The fact that many individuals are susceptible to various pollens was first noted in 1831 by Ellioton, and confirmed by later studies of Wolff-Eisner and Dunbar. Yet in spite of great advances made in medicine since, perennial and seasonal hay fever comes and goes, attacking more than one per cent. of our population and not only causing great distress, both mental and physical, but also terminating in asthma and leaving in its wake conditions incident to pollen intoxication or lighting up foci of other latent chronic infections, so that the estimation of pathological entities following hay fever are many, in some instances leading to fatal terminations.

Aside from drugs as a palliative in hay fever, nothing specific has been evolved in the neutralization of this sensitization. That hay fever patients are particularly susceptible to pollen emanations is a settled matter. Why one individual who comes in contact with pollen is entirely unaffected while another individual is very susceptible, is an interesting question. The hypersensitiveness is apparently of an allergic character in contradistinction to true anaphylaxis because of failure passively to sensitize guineapigs with blood of hay fever patients; and secondly, the necessity of giving a number of injections to hay fever patients to desensitize, whereas in experimental anaphylaxis induced in guineapigs, only one dose is required for desensitization.

Occasionally individuals are found who, in spite of giving positive reactions to various pollens, are entirely unaffected when in contact with these substance during the hay fever season. There are also individuals who react to some pollen out of the regular hay fever season but who react to more varieties of pollen during their attack of hay fever, so that in order to determine all the varieties to which a patient is susceptible, it is quite necessary to test him at, or near, the usual initiation of his attack.

Two forms of immunization treatment therefore present themselves in this condition. First, serum treatment, based on Dunbar's hypothesis that hay fever is due to a toxic portion of the pollen. A specific antitoxin, both experimentally and empirically, has proved useless. Second, inoculation of proteid of pollens has been in vogue for some years with variable results, mostly indifferent. In my own experience, until two years ago, the use of pollens alone in the treatment of hay fever, even when administered two months before the initiation of the attack, proved of little value.

I was therefore convinced that, in order possibly to get results in this condition, it would be necessary to probe for auxiliary protective therapeusis. And since the condition usually manifests itself in a catarrhal inflammation of the respiratory tract, including the conjunctiva, I was led to investigate the microorganisms of the upper respiratory tract, which is the locus minoris resistentiæ in individuals susceptible to hay fever.

The organisms usually found in the nose and throat were cultured with great regularity. The constancy with which the streptococci and pneumococci (Friedländer's bacillus, etc.) is found in great numbers, is probably due to the fact that latent organisms in the upper respiratory tract are probably the exciting causes in these pollen sensitive patients. And I therefore was led to try autogenous vaccines in conjunction with pollen treatment. The results were indeed gratifying, in that of nine patients prophylactically treated last spring and early summer, five passed their regular hay fever period with very little discomfort; of the remaining four patients three, while exhibiting some symptomatology, were not forced to leave their regular occupations as they were wont to do in previous years. One case showed practically no improvement, and it was interesting to note that this was one of mild hay fever, while the severest types responded more readily.

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*Read before the Northern Medical Society of Philadelphia, May 15, 1922.

METHOD OF PROPHYLACTIC TREATMENT.

Two months before the onset of the attacks cultures are obtained from the recesses of the nose and throat, as well as from the lower respiratory tract, by irritating the laryngeal region and causing the patient to cough on a sterile applicator. An autogenous vaccine is prepared from these cultures and twelve doses are usually administered at two or three day intervals, depending on the local and constitutional reaction of the patient. Unless one has tested the patient for pollen sensitization during an attack, it is advisable to administer a polyvalent pollen, and that is usually begun after the fifth dose of autogenous vaccine so that the patient does not react too severely to the pollens. It is desirable to avoid as much general reaction as possible from pollen injections, and therefore it is best to inject a small amount of pollen in one arm and wait a few minutes, then inject a therapeutic dose in the other arm if the patient shows no marked reaction to the small amount. Usually six pollen treatments at intervals of two to four days is sufficient to desensitize.

The shorter the intervals between the injections, the less probability of general reaction, even with large doses. The dilutions used in treatment are anywhere from one to twenty thousand to one to five thousand. In testing patients for sensitiveness to pollens, it is easier done by the intracutaneous method than by skin scarification. Individuals hypersusceptible will show definite local reactions in the form of a red wheal with hyperemic area within fifteen minutes. One must not lose sight of the fact that many cases of socalled hay fever will not improve under immunizing treatment if pathological conditions in the patient's nose and throat, e. g., sinusitis, chronic hypertrophied tonsils, are not treated. It is noteworthy that food proteids might aggravate hay fever.

In conclusion, the following points are to be observed: Every patient must be treated as an individual problem. Too much stress cannot be laid upon the early prophylactic treatment with pollen and autogenous vaccine, as treatment begun immediately before, or during an attack of hay fever, may even aggravate the symptoms.

Hay Fever: Desensitization by Ingestion of Pollen Protein

By M. D. TOUART, M. D.,
New York.

Prevention, marked reduction, or delay in the onset of hay fever symptoms are common results of treatment by preseasonal, parenteral injections of pollen proteins. Cook and his associates (1), Walker (2), Koessler (3), and many others have put the therapy of hay fever on a practical basis which in a considerable proportion of cases yields gratifying results. Even though the actual process by which clinical desensitization is accomplished is not thoroughly understood, certain requisites for its attainment are fairly well defined. The probable offending pollens must be determined for each patient by the intradermal or the scratch test. Practically all of the workers in this field agree that it is necessary to begin treatment with a dilution of antigen incapable of producing a cutaneous reaction and to proceed to the next higher strength only after reaction to it has been abolished. Walker (2) has shown that the result obtained depends very largely upon the use, in the final doses, of a one to five hundred dilution of pollen protein, smaller doses not being nearly so effective. The interval between doses is from five to seven days.

Great diligence and care and frequent skin tests are required in order to avoid the production of a general reaction, which is dangerous to the patient and tends to increase the sensitization. A long course of treatment, usually from ten to fifteen weeks, is therefore required. Choice of the antigen used depends on two factors: the patient's susceptibility as determined by the cutaneous or intracutaneous tests, and the character of exposure. The physician must therefore familiarize himself with the regional distribution of hay fever causing pollens.

Many sufferers cannot afford the expense of this lengthy treatment, others object to and actually suffer from the repeated hypodermic injections and still others, especially those suffering from the August type of hay fever, find that the repeated visits to the physician interfere seriously with their plans for the summer. While it is neither difficult nor expensive to obtain materials for testing and hypodermic treatment, many practitioners unfamiliar with the technic and the criteria governing antigenic therapy are loath to take it up. Consequently many sufferers from pollinosis go untreated.

In order to overcome some of these difficulties and to encourage the wider application of preventive treatment, I attempted during 1921 to desensitize some of my patients by mouth administration of the antigen. The following plan was finally applied in six individuals. Cutaneous tests were made to determine the causative pollens and those producing a wheal 0.5 cm. in diameter or larger were selected

CHART OF PATIENTS

Case No.	*Sex*	*Age*	*Age at Onset*	*Season*	*Sensitization*	*Antigen used*	*Duration of treatment —1921*	*Specific treatment previous to 1291*	*Result 1921*
1.	M.	36	29	Aug. Sept.	dwarf ragweed giant ragweed	dwarf ragweed giant ragweed	June 1 to Aug. 15	none	No hay fever
2.	F.	34	24	May June	timothy orchard grass rye	timothy orchard grass	June 1 to July 1	none	Relief of symptoms already begun
3.	F.	26	24	May June with asthma	timothy orchard grass June grass red top sweet vernal grass also to a number of foods	timothy orchard grass red top	May 28 to July 1	none	Relief of asthma and 75 per cent. relief of hay fever
4.	F.	26	16	May June Aug. Sept. with asthma	timothy orchard grass dandelion rose dwarf ragweed giant ragweed goldenglow sunflower cocklebur goose feathers and several foods	timothy orchard grass dwarf ragweed giant ragweed	May 26 to July 1 June 15 to Aug. 15	1920 preseasonal desensitization by injection; complete relief 1920 preseasonal desensitization by injection; no relief	Complete relief No relief
5.	M.	32	22	Aug. Sept. with asthma	dwarf ragweed giant ragweed goldenglow cocklebur corn	dwarf ragweed giant ragweed	June 1 to Aug. 15	1919 seasonal hypodermic with relief of asthma; 1920 preseasonal hypodermic with delay of onset and partial relief; no asthma	Delay and partial relief; no asthma
6.	M.	38	38	Aug. Sept.	dwarf ragweed goldenglow corn	dwarf ragweed	June 1 to Aug. 15	1920 preseasonal hypodermic; no relief	No relief

for administration. Only those pollens were used that are known to occur ordinarily in sufficient quantities to cause symptoms. A tablet triturate, salol coated for intestinal absorption, containing 0.1 mgm. of protein of each indicated pollen was administered daily on a fasting stomach. Where possible the treatment was begun ten weeks before the attack was due and continued up to the date of pollination, otherwise it was administered during the season.

The accompanying chart shows the method used and the results obtained. Six patients, one of whom was subject to both early and late types of hay fever, were treated by this method. One of the late types obtained complete relief; two of the early type obtained relief of symptoms already begun; one of the early type obtained relief from asthma and about seventy-five per cent. relief of symptoms already begun. Two of the late type previously treated preseasonally by hypodermic method without relief were likewise not benefitted by ingestion of the antigen. One of the late type, previously partially relieved by the seasonal (1919) and preseasonal (1920) hypodermic treatment, obtained a delay in onset and partial relief.

The marked difference in the effectiveness of the treatment of the early as compared to the late type, noted here, is usually observed in all forms of treatment and is no doubt due to the fact that the August and September exposure is more severe and more prolonged. I believe that insufficient doses were used and that a much larger amount of antigen could be administered by mouth without producing any unfavorable effects. A further and more extensive testing of this method will be carried out in 1922.

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Locating Fetal Heart Sounds

By L. DROSIN, M. D.,
New York.

In 1818, M. Mayor (1), an able surgeon practising in Geneva, was the first, on applying his ear to the abdomen of a patient far advanced in pregnancy, to observe and record the important discovery —the pulsation of the fetal heart.

In 1821, M. J. A. LeJumeau de Kergaradec (1) also independently discovered the sounds of the fetal heart. Although priority is given, and justly so, to Mayor, still full credit is due to Kergaradec, who besides pursuing his investigations further, made another great discovery, that of the uterine souffle. I think it is appropriate to make a few general remarks on the fetal heart sounds and their location.

The fetal heart is situated nearer the cephalic extremity than the pelvic. The posture of the fetus in the uterus is one of anterior flexion, and therefore the sounds of the fetal heart are best transmitted through the back of the fetus. Where the fetus is presenting by the cephalic extremity, the fetal heart sounds must necessarily be heard with greatest intensity below a line which divides the uterus at about its middle portion. In case the pelvic extremity is presenting, the heart sounds will be heard above this line. In practice, therefore, when the fetal heart is heard below the umbilicus the inference is safe that the presentation is one of the cephalic extremity, and the reverse holds true for the pelvic extremity.

In case of presentation of the vertex the heart sounds will be heard in the left or in the right lower segments, according as the back of the fetus occupies the left or the right segment of the uterus. On the other hand, in breech presentations the heart will be heard in the left or right superior segments, depending upon whether the back of the fetus lies in the left or right of the uterus.

For the vertex we seek the heart sounds along a line connecting the umbilicus and the left or the right anterior superior spine according as the position is left or right anterior. In case of posterior positions of the vertex the maximum intensity is posterior and to the outside of these lines.

In breech presentations the heart sounds are heard where the positions are anterior, to the left or to the right of a line extending through the centre of the umbilicus to the centre of the last rib. The sounds are discernible behind and to the outside of these lines, to the left or to the right, depending on the position, whether left or right posterior.

In case of presentations of the face the heart sounds are heard with maximum intensity in the same localities as in case of presentations of the vertex. Multiple pregnancy may be suspected by the hearing of two or more fetal hearts differing in rhythm and intensity at different points.

DIAGNOSTIC VALUE OF THE FETAL HEART.

It enables us to determine with certainty the existence of pregnancy; it is a valuable aid in the diagnosis of twins, and other conditions, in determining the condition of the fetus (by noting the character and rapidity of the beats at varying intervals); it enables us to arrive at a more correct conclusion regarding the presentation and position of the fetus, and it is invaluable as a guide in determining the advisability and time of interference in operations such as forceps, version, craniotomy, Cæsarean section, and other measures.

CAUSES INTERFERING WITH FETAL AUSCULTATION.

In addition to certain malpositions the following will interfere with auscultation: Thickness of the abdominal parietes (obesity); an excess of liquor amnii; distended bladder; gases in the intestines; accumulation of feces; a fold or folds of the intestine intervening; contractions of the uterus; the action of the abdominal muscles; anterior implantation of the placenta (being a bad conductor of sound), and external noises and the uterine bruit or souffle. The souffle, which has been variously likened to whistling, the vibrations of a base cord, the cooing of a turtle dove, aneurysmal or cardiac murmurs, a thick metallic cord in vibration, the blowing of bellows, the rushing of air through the branches of a leafless tree, and other synonyms, has its origin in the large and dilated arteries and veins at the sides of the uterus and is therefore usually heard laterally; more often to the left than to the right and sometimes anteriorly and rarely all over the uterus. It is my opinion that it is pressure, or lack of pressure on the uterine vessels, that accounts for the occurrence, location, and intensity of the uterine souffle. The agencies exerting this influence are the abdominal muscles principally and the uterine wall.

The uterus during pregnancy usually assumes a position of combined anteversion and dextroversion, consequently the anterior wall of the uterus is completely supported by the abdominal muscles; the right side partly supported, and the left side least, or none at all. Therefore the souffle is heard most frequently and loudest on the left side, less on the right, and least of all anteriorly. Another reason for the souffle being heard less frequently on the right side than on the left is the fact that the anteversion and dextroversion of the uterus causes a degree of torsion of the vessels on that side resulting in a lesser flow of blood through them. When the uterus is situated in the median line, the souffle may be heard on both sides. If the uterus is retroverted or the abdominal wall is greatly relaxed the souffle may be heard throughout the whole uterus. During labor the action of the uterine muscle supplements that of the abdominal, as during the height of a contraction the murmur disappears (as there is no blood passing through the uterus). The cause of the complete absence of the uterine souffle is the tonicity of the uterine vessels, principally, but it may also be a combination of the tonicity of vessels, uterine muscle and abdominal wall.

The uterine souffle is synchronous with the maternal heart. It may be continuous or intermittent, or distinctly irregular. It is usually single but it may also be systolic and diastolic. The position and periods of audibility of the souffle are inconstant. These variations may be explained by the inconstancy and incoordination of the action of bloodvessels, uterine muscles and abdominal wall.

Now, since the relation of the uterine souffle to the abdominal wall involves the principle of cause and effect, that is, the less the pressure of the abdominal wall the louder the bruit, then in order to eliminate it I increased the pressure of the abdominal wall as follows:

Place the stethoscope where you would expect to find the fetal heart, plant the tips of the fingers of your free hand parallel to the transverse diameter of the uterus, from one and a half to two inches above or below the stethoscope (try both) and exert gentle and continuous pressure backward when on the anterior wall of the uterus, and backward and toward the median line when laterally situated.

You will observe the blowing sounds of the uterine souffle become progressively fainter until they either disappear or they become faint enough for the heart sounds to be audible and countable. Occasionally the character of the souffle changes from blowing to sonorous or sibilant before becoming faint or disappearing. I have found this method successful in thirty-eight out of forty cases.

I would strongly advocate this method of auscultation in detecting fetal heart sounds in pregnancy or labor when obstructed by the uterine souffle.

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Five Case Histories for Record

By FREDERICK A. RHODES, M.D.,
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Medical literature is becoming so extensive that it is impossible for many physicians to do more than glance at the titles of articles and file those of interest. The fault is with the writers not the readers. The majority of our medical articles today could be reduced to a fourth of their space.

It is unfortunate that there is not some national or international method of recording cases of interest. It means but little for me to say there are only ten cases of such a condition on record. For every case recorded by the man who writes there are several unrecorded by those who do not bother with improving our medical literature. If we can get down to shorter articles many more men would report their work and certain statistics would be different. Two of the cases reported here are given briefly. No attempt is made to review the literature or enter into a discussion.

Every physician with a large practice, medical or surgical, if he would report his interesting cases, could write enough to fill a medical journal every month. Medical meetings are demanding shorter papers, and it may be possible that before long many will be read in abstract only. Hence, let us be brief, but report more, even if the report is only by titles.

Case I.—W. G., boy, aged six, while running on April 25th at 2 p. m., stumbled and fell against a board nailed upright on a mortar box. He was in a severe state of shock when seen by the physician fifteen minutes after the injury. He was semiconscious, had a rapid pulse and respiration, and a subnormal temperature. The parents refused to have the boy taken to the hospital. At this examination the abdomen was tender, especially on palpation of the upper part. There were no marks of any kind on the skin, no evidence of contusion. The doctor called again at 7 p. m., and found the boy much improved, in fact the father said he would be all right, and the doctor need not call again unless sent for. The boy had vomited twice during the afternoon. He was taken to church that night. About 7 a. m. the next morning the physician was again sent for as the boy's condition had become worse. He was found to have extreme abdominal pain. The abdomen was tender on palpation, temperature 103° F., pulse 130. A large amount of mucus had been passed by rectum. The parents then agreed to have the boy removed to the hospital which was done at once. The operation was performed at 9:30 p. m. On account of there being no tympany or obliteration of liver dullness, both rupture and obstruction of the bowel, as well as general peritonitis, were ruled out, the diagnosis being that of some visceral injury.

A left rectus incision was made. There was much free blood, which appeared to be coming from the left upper region. The incision was prolonged upward, and finding a ruptured spleen, the incision was carried to the left. The spleen was ruptured at the hilum, half the capsule was torn off, and was still bleeding moderately. Splenectomy was performed. The left kidney appeared normal, but there was marked ecchymosis of the left border of the stomach. The urine had shown a few granular casts, slight amount of albumin and a few red cells. There was still a marked secondary anemia for some time after the operation. On May 5th, the leucocyte count had risen to 34,800, after which there was a gradual fall until it became 12,400. At first there was a decided increase in the small lymphocytes and a corresponding decrease in the percentage of polymorphonuclear cells. The patient made a satisfactory recovery and now appears to be in perfect health.

Case II.—Dr. R. B. S., aged forty-seven, took ill suddenly May 25, 1920, about 3 a. m. At the beginning there was intense pain in the left lower quadrant. Vomiting began at 9 a. m. Both the pain and vomiting persisted and increased in severity. He was relieved by large doses of morphine. There were no results from enemas. I saw the patient for the first time May 26th, at 3 a. m. Examination showed the abdomen very tense with marked dullness in the left lower quadrant. There was much tympany of the upper abdomen. A diagnosis of nonmalignant obstruction of the bowels was made. The only history of trauma was that he had been pushing the lawn mower and had rested the handle against his abdomen. The patient said that he was satisfied that he had an intestinal obstruction, which was the diagnosis of his attending physicians, and he wanted an operation at once. The operation was performed at 4 a. m., being twenty-five hours after the beginning of pain. A left rectus incision revealed a gangrenous small bowel with a large amount of bloody serum. The bowel was blue black, much infiltrated, doughy to feel and appeared to be actually leaking blood. There was occlusion of the mesenteric vessels with involvement of what appeared to be about one fourth of the root of the mesentery. I resected sixty-seven inches of the ileum with the attached mesentery and a segment of the base of the mesentery, two inches long at base and a diverticulum two inches long and half an inch thick. The bowel above the obstruction was drained and an end to end anastomosis performed.

The patient made a satisfactory recovery. His highest temperature, 100.2° F., was the day following the operation. After the fifth day the pulse was 100 or under, practically all the time.

Case III.—Mr. H. K., aged fifty-four, had been sick for several years, worse for three months prior to admission to the hospital, but continued to work. There was knifelike pain in the left hypochondrium on inspiration; worse in the evening. There was no history of injury. The pain became worse rapidly. There were no subjective symptoms except the pain which made him very weak. Physical examination revealed a mass extending two inches below the border of the ribs on the left side. No nodules were felt. A diagnosis was made of enlarged spleen, probably caused by a sarcoma. At operation a large nodular spleen was removed, which the pathologist reported to be sarcoma. There were many adhesions on all sides. The splenic artery was torn in freeing the spleen. The tail of the pancreas was caught in a ligature, as a result of which there was a discharge of pancreatic juice for some time. The patient made an excellent recovery, and felt well for three months until an active process of the sarcoma set in causing his death in a few days.

The blood examination two days before the operation was hemoglobin 76; white blood cells 11,600; red blood cells 4,100,000; polymorphonuclears 61; large lymphocytes 20; small lymphocytes 15; eosinophiles 4. After operation there was a rapid increase in the white cells which in five days reached 29,000, then a decrease to 21,800 in four weeks. The red cells gradually increased for a month to 5,725,000. The polymorphonuclears were increased for a few days but diminished to forty while the large lymphocytes increased from twenty to forty-five at the end of a month.

CASE IV.—Mrs. S., aged thirty-two, had had five children, three (?) abortions in the six months before a ruptured left tubal pregnancy, which with a left cystic overy, was removed in 1917. Had been well since, until her present trouble. Has missed menstruation by a few days. There were extremely severe pains for two days, then they became slight up to time of examination, five days after first pain. Examination revealed a mass in the right pelvis with a diagnosis of ruptured tubal pregnancy.

The operation (August, 1921) was delayed for three days until the patient could arrange her affairs to enter the hospital. The right tube had ruptured and the tear had closed. The amniotic sac was about the size of a large orange and situated near the right ovary, which was cystic. The placenta was attached to the right broad ligament. There was an excellent recovery.

It is quite possible that many more abdominal pregnancies would be found if patients neglected to have examination made and delayed entering the hospital, as did this patient.

CASE V.—F. L., male infant of eight weeks, weight seven pounds. This child was born prematurely at eight months and had an undescended testicle. On March 23, 1921, while the nurse maid was bathing the child, it began to cry as if in great pain and she noticed a lump in the groin and called the child's father, who is a New York physician and was stopping at one of the local hotels. The father diagnosed the condition as a strangulated hernia, which he could not reduce, so rushed to find a surgeon and I happened to be the first one he found. Upon examination, I confirmed the diagnosis and told him to take the child to the hospital at once. By this time it was vomiting frequently. Operation was performed as soon as possible. I reduced the inguinal strangulation, finding an atrophic testicle in the sac. The time of the operation was eighteen minutes. Only a small amount of chloroform was used on account of the frailty of the child, which had to be forcibly held during the last part of the operation. I preferred to have, as the lesser evil of two consequences possible, an infection rather than a death from anesthesia. The wound healed nicely, the child being taken to the hotel six days after the operation. The parents report the child in excellent health.

JENKINS ARCADE BUILDING.

Theory and Practice of the Steinach Operation

Second Communication[1]

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In this article the fundamental principles of the Steinach method of regeneration or restitution will be touched upon but briefly. I shall also assume that the animal experiments leading up to the vasoligation as a rejuvenation operation and the technic are fairly well known. I shall, however, discuss different points regarding the theory, and later review the recent literature of the subject, as far as its practical application is concerned. While Steinach's theory of the puberty gland is still being discussed, and the question of why the vasoligation produces certain clinical results, has by no means been settled in its detail, one fact remains well established: the male sex gland (and I intend to treat only that) has an inner secretory function and is sexually specific. That is, it determines the sex character of the individual. I shall not dwell upon the transplantation experiments, carried out by Steinach and corroborated by others, which conclusively proved this sexually specific function and are at present rarely discussed. The discussion centres around the question as to what part of the testicle this inner secretory function is to be attributed. Two opposing camps still exist in scientific circles; the first one attributing the production of the hormone to the sperm producing cells, or cell groups, i. e., the generative portion of the testicle, the second one asserting that the interstitial tissue with its Leydig cells is the hormone bearing portion.

Histologically the generative portion consists of the seminiferous tubules with a basal border of columnar (socalled Sertoli) cells, bearing in the central direction the semen producing cell groups, the final deferential phase of which is the ripe spermatozoon. Between these seminiferous tubules we find the interstitial tissue, composed of slender bands of connective tissue, containing the round, occasionally pigmented Leydig cells. It is to these Leydig or interstitial cells that Steinach and his followers ascribed the specific internal secretion and to which

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[1] First (preliminary) communication, New York Medical Journal, December 21, 1921.

Steinach has given the name puberty gland. Steinach's puberty gland is therefore nothing but a simpler expression for the more complicated term incretoric portion of the male sex gland, and is exactly the same as Bouin and Ancel's *glande interstitielle.* In order to make it quite clear, the puberty gland is not an organ in itself, but a group of cells, or combination of groups within the testicle, responsible for the gonadal hormone. I shall later discuss the elements which enter into this combination. While designating the inner secretory portion, puberty gland, let us, for simplicity, call the histological structure that produces the semen the generative gland.

As the foremost exponents of the puberty gland theory, or better, of the theory that the interstitial tissue and Leydig cells are the main hormone producing elements, I mention Bouin and Ancel, Steinach, Tandler and Gross, Sand, Lipschuetz, Moore, Morgan, Boring, Kuntz, Massaglia, and Goodale.

A number of observations and experiments have been carried out to prove this theory, and the first method was the ligation of the vas deferens. Bouin and Ancel were the first to use this method, and they found that the testicle of animals subjected to this operation developed a complete atrophy of the spermatogenetic apparatus, while the development or maintenance of their secondary sex characteristics was not influenced. Tandler and Gross corroborated this on a buck deer, Steinach on rats, and Kuntz on dogs. They further observed that the only cells of the generative gland which did not completely atrophy, were the Sertoli cells. The Leydig cells did not atrophy but, on the contrary, showed in all cases a distinct proliferation. In order to determine whether the Sertoli cells took any part in the formation of the hormone, Bouin and Ancel, and later Sand, castrated animals on one side and ligated the vas on the other side in the expectation that a compensatory hypertrophy of those elements which were responsible for the internal secretion would result. It was found that only the interstitial cells had hypertrophied while the number of Sertoli cells remained unchanged. The interstitial cells showed at the same time (according to Lipschuetz) all the signs of great secretory activity and were accumulated in great masses around the bloodvessels. This seems rather significant when we consider how Nature always produces a rich blood supply for all the incretory glands. This last experiment seems to prove that the Leydig cells are of greater importance for the internal secretion than the Sertoli cells. It was observed at the same time that the sex characteristics of all the animals used for the experiment remained normal, or developed normally and that the sexual libido seemed especially pronounced. Thus the ligation of the vas shows, in its histological consequences, that the interstitial cells probably to a greater extent, and the Sertoli cells possibly to a lesser extent, are the incretory elements of the testes.

A corroboration of this is seen in the study of kryptorchism. A kryptorchic testis shows a complete atrophy of the seminal tubules, but preservation of Sertoli cells and a hypertrophy of Leydig cells. A stallion with one sided kryptorchism, if deprived of the other normal testicle, maintains his stallionlike characteristics. No longer possessing a generative gland he should show signs of being castrated if the generative gland were the incretory organ. Furthermore, men with doublesided kryptorchism, which means the absence of generative glands, have fully developed sex characteristics. Here Nature has provided an experiment to disprove the theory of Steinach's opponents. Bouin and Ancel have shown that the more interstitial cells there are contained in the testicles of the kryptorchic hog the more distinctly the sexual apparatus is developed. Lichtenstern. completely atrophied epithelium, for the successful cure of castration. Although Bouin and Ancel have observed a case of kryptorchism in a hog, where the sex characteristics were normal and the testes showed atrophy of seminal epithelium and Sertoli cells, still, it seems likely that the Sertoli cells take part in the inner secretory function. Steinach is the last one to deny this. He has been misunderstood on that point. Clarifying his position might help bridge over the differences between the opposing groups of scientists.

A third corroboration of the interstitial gland theory is furnished by the transplantation experiments. Effects of castration have been cured by implantation of normal testicles, which on later examination showed similar atrophy to that of the generative gland with a hypertrophy of the interstitial tissue. Steinach has used such transplanted testicles with their atrophic seminal cells for a new implantation in artificial castrates and has cured the effects of the castration. This experiment shows that the generative portion of the testicle can not have anything to do with the incretory function. According to Steinach the transplanted testicle shows, after several months, a degeneration of the Sertoli cells, and after that the seminal tubules collapse entirely and disappear, the interstitial cells alone remain. Many months later the Leydig cells also begin to degenerate, connective tissue taking their place, and a second and third transplantation has to be performed in order to forestall the effects of castration. (This experiment shows us that the transplantation of animal glands into man is not promising, as far as lasting effects are concerned. A good temporary result is undeniable.)

French scientists have exposed testicles of different animals to x rays and found the spermatogenetic portion of the testicles destroyed with the interstitial tissue left intact. No change was noticed in the sex characteristics of these animals.

In addition to these experiments I should like to mention another which was undertaken by Steinach in order to disprove the possibility of sperma having an incretory influence. Steinach injected fresh diluted sperma at regular intervals, first into early castrates (animals castrated before puberty) and found the penis, seminal vesicles, and prostate remaining infantile, secondly, into belated castrates (animals castrated after puberty) and found that the effects from the castration developed in spite of the injections.

The opponents of Steinach and the puberty gland theory, of whom I mention Aschoff, Tiedje, Benda, and Steve, assert that the interstitial tissue and Leydig cells have a trophic function only, and that the hormone production is dependent upon the generative cells. They base their statements mainly on the fact that some months after vasoligation a regeneration of the first atrophied generative gland or seminal cells takes place. This regeneration has been observed and described by Steinach himself, but cannot possibly disprove the deductions drawn from the results of the previously related experiments. The fact that a number of scientists repeating Steinach's experiments did not observe the same histological changes does not disprove the puberty gland theory as corroborating evidence is overwhelmingly larger.

The question arises: Why has Steinach given the incretory portion of the testicle the name puberty gland? Briefly, because this gland is in a natural state of proliferation during the time of puberty, the time when the influence of the sex gland produces the most prominent changes in man's physical and mental makeup. But this well known time of puberty in men (around the middle of the second decade) is probably only a second great phase of puberty. Kasai has made extensive studies of the puberty gland, examining its histological structure at all ages and found a hyperplasia of Leydig cells to exist in three different stages of the human life. The first one around the fourth embryonic month, which seems to be the time when the sex of the new human being is decided and when the differentiation takes place, the second around the fifteenth year and, strange to say, the third in old age, but here the Leydig cells are found to be distinctly pigmented, most likely indicating senile atrophy. The apparent proliferation therefore cannot be used as an argument against the puberty gland theory.

From the foregoing experiments and observations I would like to draw with Lipschuetz the following conclusions: The inner secretory function of the male sex gland is independent of the spermatogenetic part of the testes, is bound to the puberty gland, consisting of interstitial cells and perhaps Sertoli cells, and determines and maintains the physical and mental sex characteristics. It is probable that the puberty gland reaches a climax of activity in man twice, in the embryo and in the middle of the second decade. During childhood the puberty gland apparently persists in an intermediary state of rest, where the formation of sexual characteristics progresses slowly.

After having established the fact that transplantation of testicles into old animals has a regenerating effect (homoplastic treatment) and assuming that this regeneration is due to the proliferation of Leydig cells, in consequence of atrophy of the now useless generative portion, Steinach conceived the idea of producing the same regenerating effect by the ligation of the vas deferens, which caused a subsequent proliferation of the puberty gland. It is known that this assumption proved correct and that vasoligation has indeed shown clinical effects in the sense of regeneration or reactivation, in certain cases equaling rejuvenation. While the majority of clinicians employing vasoligation for the purpose of restitution gradually accepted Steinach's theory, his opponents are still trying to account for the undeniable clinical effects of vasoligation by asserting that the vasoligation through the spermastasis causes the increased resorption of spermia and spermatogenetic tissue and that the assimilation of these proteins produces the clinical results. The justification of this theory is difficult to conceive for the student of endocrinology to whom the puberty gland theory is more feasible.

There is only one point that seems to speak for the theory of the protein absorption, and that is that early clinical symptoms frequently follow vasoligation. Occasionally, not always, signs develop twenty-four hours after the operation, consisting of an unusual sense of wellbeing, increase of appetite, mental and physical energy, a lowering of blood pressure, and an increase of sexual functions. Hypertrophy of Leydig cells, following atrophy of the generative gland, could not explain these early symptoms. That the resorption of sperma is the cause seems highly improbable, for why do not frequent injections of diluted sperma have an effect? Could it not be possible that through the stasis of sperma, following the ligation of the vas, the seminal tubules are distended to such an extent that they exercise a mechanical pressure on the interstitial tissue causing a suddenly increased output of the gonadal hormone which is equal to that which the existing Leydig cells are capable of furnishing? After this mechanical pressure has ceased no further internal secretion would be stimulated, and the initial clinical improvement ought to subside. As a matter of fact, the disappearance of such clinical symptoms has been observed but where they persist an endocrinological explanation can be found, namely: the initial output of gonadal hormone influenced the whole endocrine system in a favorable manner. Several weeks, or even several months after the operation, the proliferation of Leydig cells begins and parallel with it the onset of the definite clinical improvement, the degree of this depending no doubt upon the endocrine constitution of the patient. Thus, I believe, the early symptoms, aside from the possible explanation of autosuggestion, need not necessarily clash with Steinach's puberty gland theory, but could well be brought into harmony with it.

There is no doubt that a much larger clinical material about the regenerating effect of vasoligation exists than has been reported in the medical press, the reasons being:

1. Relatively little objective data can be offered to prove the success of the operation, and many surgeons may fear hostile criticism by citing mainly the subjective improvements of their patients.
2. They might be afraid to be accused of seeking sensationalism in reporting a rejuvenation method.
3. They might prefer to wait with the report of their clinical results until the theoretical questions are definitely settled, as well as the other question as to possible injurious effects, and whether the good effects are of a lasting nature.

Finding objective data is certainly of great importance and methods should be elaborated to assure this, although for a student of endocrinology the subjective symptoms which the patient relates or writes about are also quite weighty. As objective facts Lichtenstern records weight, blood pressure, appearance of skin, growth and pigmentation of hair. Loewy and Zondek added as a possible objective proof the determination of basal metabolism. Peter Schmidt takes photographs of his patients, near view of face, bust or crown, describes growth, thickness and pigmentation of hair, notices degree of heat and pigmentation of extremities, determines muscle power with the dynamometer in addition to routine examination. Besides, a careful history is taken, especially regarding the patient's comfort.

As far as sensationalism is concerned, this fear is justified, but it must be remembered that a method of rejuvenation is unfortunately in itself so sensational that no one interested in the subject and showing an interest can entirely evade such an accusation. It is certainly true and comprehensible, too, that the lay press takes a much greater interest in the Steinach method than in any other new medical discovery. The question arises whether the public is entitled to more information about this subject. The most suitable subjects for the Steinach operation are not to be found in hospitals, not even in doctors' offices.

I have discussed at length the theoretical questions. As to injurious effects, we should differentiate between harm resulting from the operation and that resulting from the success of the operation. It is not impossible that harm might be done in certain cases. A badly damaged cardiovascular apparatus might not stand the strain of increased endocrine activity and certain endocrine disturbances might react unfavorably on the artificially produced hypergonadism. A case has been reported by Mendel of a man of sixty-one, who died about three months after the operation (a bilateral vasoligation between the epididymis and the testes) with the symptoms of acute mental disease. Suspicion has been expressed that a testitoxicosis might have been the cause of the fatal ending, although Bonhoeffer, the well known Berlin psychiatrist, diagnosed the psychosis as of a typically arteriosclerotic nature. No other cases have been reported which furnished proof of injurious effects.

In regard to the Steinach operation in tuberculous patients I do not wish to omit the recent experiments of Hans Mautner, of Vienna, who has artificially infected a number of guineapigs with tubercle bacilli and castrated some of these animals: the castrated ones usually survived the others. In another series of experiments Mautner ligated the vas deferens in a certain number of guineapigs, infected with tuberculosis, and found that these animals succumbed to the infection usually within one or two months, while the castrated and noncastrated, i. e., normal animals survived the infection two and a half to three and a half months. Whether these experiments have any clinical value and perhaps justify us to accept active tuberculosis as a contraindication for the vasoligation, is impossible to decide at this time. In saying that harm might result from the success of the operation I mean that the patient may overdo his enjoyment of life. If the patients are carefully warned, and adhere to the warning not to change their mode of living too rapidly and radically, such dangers from a successful operation ought to be prevented.

As to the lasting nature of good effects, I am unable to make a definite statement. Lichtenstern's oldest cases date back five years, and are still reported as doing well, with the exception of one very old man, who, after four and a half years of activity, shows signs of a second senility, so that an operation is contemplated on the other side.

In regard to recent literature, Schmidt, in a late German publication, reports deductions from his own clinical material, as follows: First, the somatic changes were: increased body weight, up to twelve kilos in the most extreme case; denser growth of hair and accumulation of pigment; gain in muscular strength, up to twenty fractions of the dynamometer; decrease in blood pressure for about thirty mm. of mercury; improved blood circulation in extremities and genitals; improved hearing and eyesight, which could be partly demonstrated objectively; and improved, or rather restored, sexual potency, a symptom observed in practically every case. The psychic changes consisted of increase in mental alertness, personal initiative, power of recollection, desire for work, accentuated selfconfidence, joy of living, and sexual libido. These findings confirm and add to Lichtenstern's observations. Loewy and Zondek found increased metabolism, following vasoligation, as demonstrated by larger consumption of oxygen. Finsterer and Horner, of Vienna, obtained extraordinary increase in body weight in cases of cancer cachexia setting in from four weeks to six months after operation. I am not prepared as yet to report about my own clinical material, consisting at present of fifteen cases, but the results I have obtained so far are promising. In practically all cases I have observed a gain in weight, a decrease of blood pressure as well as the appearance of mental buoyancy. Since my first paper on the subject in November of last year three other favorable reports have been made in this country, and to my knowledge no unfavorable ones. Dr. Chetwood recently read a paper before the County Medical Society, stating his own results on some cases dating years back. Dr. Michel has also presented a successful case, and recently Dr. Wolbarst has published his experiences, corroborating Steinach's claim of the regenerating effect of vasoligation, at least in a percentage of cases.

One of the latest literary contributions comes from Copenhagen. Knud Sand, a well known pathologist, made a bilateral ligation on a dog, twelve and a half years old, and generally so senile that a prominent veterinary surgeon advised having the animal killed. The dog was described as having numerous hairless spots and wounds on the skin, its eyes were running, its ability to hear, smell and walk and also its vision were reduced to such an extent that on the whole it offered a pitiful sight. The animal displayed no interest in other dogs, was extremely thin and had a poor appetite. No organic affections were found, except a contracted kidney due to the senility. The operation wounds healed after two weeks. The animal then began to walk a little and also to display a slight interest in other dogs. Its appetite was improving, and the same veterinary surgeon made an examination five months after the vasoligation was performed. It was found that the hair of the animal was glossy, the wounds and hairless spots on the skin had disappeared, the eyes were clear, and hearing, smell, and vision had become almost normal. The dog walked and ran about, showed an interest in female dogs, which it had not done for three years, and, according to the owner, *potentia coeundi* was manifested. The master took his dog on hunting trips and was quite satisfied with his performances. Knud Sand considers the remarkable result of vasoligation in this case as an indication of possible similar reactivating effects on human beings. Personally I believe that this might be so in certain cases, but generally I am inclined to advise against the operation on very old men who show a distinct senile atrophy of the testes. Besides this contraindication, and a seriously disturbed cardiovascular apparatus, no other definite contraindication has been established.

Hanak, of Paris, has recently subjected Steinach's method to severe criticism, coming to the conclusion that the "morphogenic agent" produced in Steinach's rejuvenated testicle is not sufficient to restore the entire set of atrophied or degenerated organs. He thinks such rejuvenation constitutes theoretically a danger to the ageing organism. This again leads into the question of possible injurious effects, which I have discussed at length.

The reports of the First International Congress for Sexual Reform and of the Viennese Urological Sessions show that all the clinicians performing vasoligation recognize its beneficial effects. The Schmidt comes to the following conclusion: "We may state that with correct indication, technic, and dose, vasoligation of one or both spermatic ducts affects the organism favorably in the sense of vastly improved metabolism and accelerated organic functions. In numerous cases these somatic changes were accompanied by a parallel increase in physical and mental vigor. This fact was proved by those patients who had only a superficial knowledge of the character and possible subsequent effects of the operation, and who, in spite of that, volunteered histories of their psychic and psychosexual improvement. Thus, they cannot be suspected of having been influenced by suggestion. Certain cases showed all the described somatic and psychic symptoms simultaneously. The patients' visual acuity had improved, their sexual potency was restored, hair had regrown, dense and pigmented, the turgor of their skin and their whole appearance and bearing, speech and action had been transformed to such a degree, that the entire picture had gone far beyond what Steinach had termed a 'restitution within modest limits.' Here the words rejuvenation could justly be used."

Blum, of Vienna, discusses in a recent paper the question whether the rejuvenation following prostatectomy is a "Steinach effect" and comes to the conclusion that it is not. He believes that the favorable effect of prostatectomy to the general health of the patient is due to the elimination of the causes of retention of urine and the suppression of the strongly toxic effects of prostatic adenomas, and to a possible internal secretion of the prostate. Others are of the opinion that the remarkable general improvement, occasionally observed after prostatectomy, is to be attributed to the severing of the ejaculatory ducts, incidental to the operation, which would constitute a "Steinach effect." In some cases prostatectomy had no rejuvenating effect, but such was attained through the Steinach operation, performed several months after the prostatectomy. Haberer has ligated the vas in order to reduce the hypertrophied prostate and has succeeded to such an extent that in forty per cent. of his cases a subsequent prostatectomy was found unnecessary.

In conclusion, just a few more words about indication, technic, and dose. Generally speaking an existing hypofunction of the gonads is an indication for the vasoligation. A diagnosis of such a condition is difficult. Premature and physiological senility are the principal indications, as well as the male climacterium, beginning arteriosclerosis, and those cases of functional impotency, even in young men, which give reason to suspect the internal secretion of the testicles to be at fault. It is impossible to draw a sharp line between premature and physiological senility, and I would generally say that the Steinach operation is indicated where symptoms of old age appear without the existence of an organic disease to explain their presence.

The technic has to fulfil two principal requirements: The interruption of the continuity of the vas, so that recommunication is excluded, and the preservation of the blood supply, by stripping the vas clean of the accompanying bloodvessels. In sewing the lower stump of the vas into a place far apart from the position of the upper stump I think we are able to bar a possible recommendation. It is occasionally difficult to decide upon the side for the operation. For instance, a man might have formerly had a onesided epididymitis. We do not want to sterilize him, but are liable to do so if we operate on the normal side. If we select the other side, where the epididymitis has possibly already obstructed the vas, we might not get the proper result. I would, in a case like this, ligate between testicle and epididymis on the side of the former infection.

The closer to the testicle the ligation is performed the more sudden the stasis will be, and the greater the dose the patient receives of his gonadal hormone. The fatal case that Mendel reported had the operation done bilaterally between epididymis and testis. He received, therefore, the strongest possible dose. I would be careful in applying this procedure and would prefer to perform only unilateral ligation and at a certain distance from the epididymis, if both testicles are normal.

Many points are still open to discussion. Overenthusiasm, which I am trying to guard against, will eventually subside, as will unreasonable opposition. The occasional attacks directed against Steinach's work from lay circles, which are probably inspired by puritanical and hypocritical views, can easily be ignored, but it is highly regrettable that even eminent physicians stoop to criticize and belittle Steincah's brilliant scientific attainments, displaying their lack of knowledge of the subject by confusing Steinach's work or listing it along with Voronoff and even the unscientific announcements of Brinkley.

I am confident that a more serious study would soon bring about a better understanding and appreciation of Steinach's ingenious work.

Taking as conservative and critical a view as possible the following fact stands out:

With Steinach's vasoligation we are able to influence the endocrine system beyond the question of a doubt, and that clinical results in the sense of a regeneration can and have been obtained, is by now also an undeniable fact.

A complete bibliography will appear in the author's reprints.

Roentgen Treatment of Diseases of the Generative Organs

By I. SETH HIRSCH, M. D.,

New York.

(Concluded from page 73)

In determining the number of series and the intervals of the series, there are two considerations: First: The local changes in the pelvic organs. Second: The systemic response.

1. It must be conceded that in carcinoma it is a great advantage gained to be able to administer the full dose in as short a time as possible with the aim of overwhelming the affected tissue. On the other hand, when castration is the result desired and no urgency exists, the mental and physical shock resulting from a prolonged session is an indication for the utilization of divided doses and only the total minimal dose necessary to produce the result.

With the modern therapeutic methods, at the distances utilized, the effective dose may require eight to twelve hours. If patients cannot stand this prolonged session, it may be divided into two to four days. In order to shorten the actual duration of the treatment the radiation may be simultaneously applied by two or more tubes each, adjusted over a separate portal, or when the carcinomatous lesion is superficial, by two tubes operating over the same portal.

However given, when a full dose has been administered through each skin area, the series is complete. It then becomes necessary to wait until the reaction, both skin and systemic, have subsided. At the end of this interval, if necessary, a second series is similarly applied, and after another interval a third. (A portion of the skin or "a portal of entry" which becomes the seat of a third degree reaction is closed as far as further treatment through this portal is concerned. In fact, a severe röntgen dermatitis due to previous radiation is an indication in favor of operability of the pelvic condition.)

We have at the present time in the ultraviolet light a method of "doping" the skin whereby severe dermatitis is prevented, even by an overdose. In dosage with the very penetrating radiations and heavy filtration now in use, the erythema may be very transitory and the bronzing very intense.

The administration of all the areas at one sitting, even in carcinoma, where the growth is to be effectively dosed in as short a period as possible is not always feasible. Radiation sickness, which a great number of patients have, to whom are administered the large doses, may make it impossible. This "sickness" is due in part to the breaking down of the cellular elements of the blood and the organs and the liberation of nucleins in the blood (these leucotoxins have a destructive influence on the leucocytes themselves and a markedly irritating effect on the kidney epithelium) and also to the disturbance of the secretion of the organs attacked. This, however, is not the only factor concerned in this troublesome condition. The static discharge distributed over the surface of the patient's body, as a result of long treatments, also plays a part as do numerous psychical factors.

Such patients are made very uncomfortable for some time. This is avoided if the number of doses given in one day is limited. The organism then has an opportunity to eliminate the destroyed products. In some conditions (leucemia) the administration of a very large dose in a short period is actually dangerous. (The reaction of the blood cells to the röntgen ray is striking. According to Murphy, Ross, Chambers, Scott and Mottram, the most striking effect is that which it has on the total number of lymphocytes to the centimetre of blood. At first there is marked diminution in the number of circulating lymphocytes which reaches its lowest level forty-eight hours after the administration of a röntgen dose. There is then a primary rise which reaches its height in from three to five days, due to the contribution of the blood of lymphogenic cells from the lymph glands, bone marrow, etc., and then a secondary fall occurs which reaches its lowest level in from five to twelve days. This again is followed by a secondary but permanent rise which persists for at least six or seven weeks and represents the complete regeneration of all lymphogenic tissues. When, however, the treatments are given a successive number of days these phases may overlap and the permanent increase is much delayed. This selective affinity of the röntgen ray for the lymphocytes is occasionally also accompanied by destructive changes in the granular blood cells. The repeated large doses, by diminishing the number of lymphocytes, lower the power of resistance of the patient, for the lymphocytes play an important rôle in defending the body against the invasion of many malignant growths and their destruction predisposes to metastasis. Small doses, however, will rapidly increase the lymphocytic content of the blood and fortify the body against secondary deposits. An increase in the polynuclear neutrophilic elements has also been reported. A breaking down of the lecithin in the blood with the formation of certain byproducts has been reported. This may account for the symptoms of weakness which are sometimes present. Though the significance of these changes is not yet completely understood, the above data suggest a more complicated technic than is now followed.)

The modern treatment with highly penetrating rays through large portals, particularly so when the full dosage over several areas is applied in one session, has resulted in such a terrific destruction of the red blood cells as to produce fatal anemias. An attempt has been made to cope with this "röntgen cachexia," as it is called by transfusion.

This heroic measure, however, only becomes necessary when the radiation attack is made upon a blood already impoverished as a result of the condition for which the radiation is applied. It is, therefore, advisable in all cases to make a preliminary examination of the blood and then by suitable means, rest, forced feeding, arsenic and iron injections, to bring the red cell condition to as nearly normal a state as possible. This will be referred to later, in the consideration of carcinoma.

During the radiation period and afterward attention should be paid to the general body hygiene. Rest (enforced in cases of carcinoma), regulated diet, mild catharsis are very important. After every series, particularly when heavy dosages are given for malignancy, it becomes exceedingly important to indicate to the patient the impending changes in the skin and the necessity for carefully observing certain precautions, as regards irritation, mechanical, chemical or physical of the skin over the portals through which therapy has been administered. A lotion such as the following (Dodd) should be applied daily for three weeks:

Zinc oxide	½ oz.
Carbolic acid	½ dram
Glycerine	1 dram
Aqua calcis, q. s	8 oz.

or an ointment consisting of

Cera alba	2.1
Cetaceum	2.4
Ol. olivæ	18.0
Aq. dist.	7.5

The series should not be repeated until the skin reaction has subsided. So also the blood must return to as nearly a normal state as possible. This may take three to six weeks. When large fields have been used, it may be twelve weeks before restitution is accomplishd.

The general tonic effect on the whole system which is often observed during and after x ray treatment is not only due to the result of the local curative action but to a regulating general effect on the endocrine secretion. There is also apparently a decided change in the chemistry of the blood, which shows itself frequently by an absorption of metastasis at a distance from the focus treated.

TREATMENT OF MYOPATHIC HEMORRHAGE.

This type of bleeding is associated with an exaggerated form of the normal changes in the endometrium during menstruation. The cycle of changes through which the endometrium passes is coincident with the cycle of development and recession of the corpus luteum, therefore, in pathological as well as under normal conditions, uterine bleeding is controlled by the corpus luteum. This in turn is probably affected by other glandular secretions. This pathological bleeding is merely a variation in amount, duration, character and periodicity from the normal. This being so, the logical procedure to be followed, if it is desired to cause a cessation, is to destroy that element which controls the menstrual cycle, namely, the graafian follicle, the forerunner of the corpus luteum. Since this ripe follicle is more sensitive to the ray than is the primordial follicle, a smaller dose may destroy only the mature follicles and produce temporary amenorrhea, a larger dose will destroy the primordial follicles and give a permanent amenorrhea. It must be conceded, however, that since radiotherapy acts by destroying the graafian follicles and causing sterility, it is not the ideal treatment, therefore, since the excessive hemorrhage in the grossly normal uterus is due to a disturbance in the proper balance between the various elements controlling menstruation, the aim first should be to restore this.[3] A restitution to their normal condition of the factors governing menstruation may be attempted by endocrinological therapy, for the menorrhagias at puberty, not produced by myomata or retroflexion are undoubtedly ovarian in their origin; while the climacteric bleeding is also associated with dysfunction of the ovary at this critical period.

Though only a small proportion of the cases will be benefited, nevertheless this should first be attempted if the bleeding is not severe. In severe hemorrhage radiotherapy is the method of treatment. In persistent hemorrhage and dysmenorrhea the production of menopause is justifiable even in young women, when the emotional and mental stability is threatened. The therapeutic aim in the metrorrhagia being to bring about a normal restitution of the menstrual function, the radiation should be administered serially, in sufficiently divided dosage to permit the control of the effect. A three weeks' interval is suited to most cases.

The degree of amenorrhea which can be produced depends upon the period of time in relationship to the physiological climacterium in which the symptoms are manifested. The nearer a woman is to this period, the more easily will amenorrhea be produced and the more difficult the production of oligoamenorrhea. At puberty the production of the desired effects is fraught with difficulty. In women under thirty a partial amenorrhea can be produced. In women between thirty and forty a partial amenorrhea will result once for every five cases in which complete amenorrhea takes place. Even one series at this period may produce a permanent amenorrhea, particularly in individuals who belong to the class in which menopause takes place early. As a result of similar series of radiation the effect, depending on the age, varies as follows:

10-20 years	oligoamenorrhea 80%	amenorrhea 20%
20-30 years	oligoamenorrhea 66%	amenorrhea 33%
30-40 years	oligoamenorrhea 33%	amenorrhea 66%
40-50 years	oligoamenorrhea 3%	amenorrhea 97%

Even in the small percentage of cases where amenorrhea occurs in youthful individuals, menstruation usually reappears after a short interval, but its characteristics are relatively normal.

In women near the menopause age—thirty-eight or over—radiotherapy will produce immediate menopause and the general physical and mental disturbances resulting from the irregular uterine hemorrhage will be avoided. Radiation is the treatment *par excellence* for climacteric hemorrhage. It cannot be denied that with careful technic all cases in this category can be benefitted by the x ray.

FIBROMYOMATA.

What the causal relationship between fibroids and the uterine bleeding is, is not clear. The ovary is a gland of internal secretion and a trophic centre for the whole genital apparatus. It is undoubtedly intimately concerned in the production of neoplasms in the uterine musculature. Apparently the hemorrhage is an accompanying symptom—which owes its origin to a similar if not the same cause.

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[3] In amenorrhea, associated with Basedow's disease, a small dose applied to the ovary may bring on menstruation. A preliminary curettage has been suggested in all cases of climacteric bleeding, in search of a possible malignancy.

There are three theories as to the mechanism by which fibroids, subjected to the rays, diminish in size.

1. The fibroid undergoes an artificially produced atrophy—similar to the normal atrophy at menopause. The latter is associated with ovarian changes.

2. There is a direct action upon the smooth muscle cells by the rays, causing them to degenerate and to become replaced by connective tissue. (Fibroids shrink more rapidly after radiation than after castration or following natural menopause.)

3. The endarteritis produced is severe enough to starve the myomatous growth.

The ray undoubtedly calls into play all three factors, though the first and second are the most potent. The reduction in the size of the fibroids may be appreciable before the advent of amenorrhea and fibroids in women who have already had their menopause may be reduced by radiation.

The factor to be considered in the determination of the mode of treatment depends on: 1, age of individual; 2, characteristics of tumor, age, location, size, rate of growth; 3, complications. A. Functional disturbances, a, menstrual disturbances, b, pressure symptoms, and c, pregnancy. B. Organic disease.

THE AGE OF THE PATIENT.

The bleeding from a uterus, the seat of a myoma, just as the bleeding from a uterus showing no gross pathological lesion, is more easily controlled the nearer the patient is to the menopause. The hemorrhage of fibroids usually appears, however, later than the myopathic hemorrhages; therefore, the latter are more responsive to the treatment. In general it may be stated that the hemorrhage due to fibroids should be treated by radiotherapy in those women in whom a permanent menopause is not objectionable. In women about forty with slow growing tumors and symptoms of hemorrhage, pain and pressure, the beneficial effects are striking in their rapidity and permanency. Some observers do not approve of the treatment of cases under the age of thirty, because of the production of premature menopause. This point must be taken into consideration with all the other factors in the case. Because the uterus is preserved for child bearing, it is held by some that myomectomy is the preferable procedure in young women with fibroids and menorrhagias.

The contraindications (phlebitis, obesity, anemia, disease of the heart, lungs, liver and kidney), which before radiotherapeutic days were considered, but nevertheless risked, should now be considered as indications for the radiation treatment, irrespective of age. Even if severe, the menopause symptoms are to be preferred to any operative risk, for they can be fairly well controlled by organotherapy.

LOCATION.

The location of the mass influences the method of treatment.—Thus: 1, Interstitial fibroids are most amenable to this treatment; 2, subserous fibroids are best treated by surgery, and 3, submucous fibroids are amenable to x ray treatment but had better be treated surgically. (These tumors have a tendency to malignant degeneration.)

But pedunculated myomata, partially extruded from the cervix, myomata, the seat of cystic calcareous, gangrenous degeneration, or associated with carcinoma, large, rapidly growing myomata, producing severe pressure symptoms and rapidly growing myoma with severe hemorrhages and not rapidly responsive to radiation, are surgical conditions requiring surgical treatment. These indications are, however, not sharply defined. A subserous growth, if small but the cause of pain, may be attacked with x ray with excellent results, producing marked shrinkage in the growth with cessation of symptoms. Similarly, submucous growths in patients in whom severe operations cannot be performed, may result in shrinkage and extrusion of the growth and its removal by simple surgical means. These cases must, however, be closely watched for dangerous hemorrhages may occur after radiation. (Such submucous, pedunculated myomata are frequently overlooked clinically.)

In the interstitial growths, the results are uniformly good. There is amenorrhea, marked shrinkage of the growth and general systemic improvement. The dysmenorrhea of interstitial metritis may be greatly relieved by radiation.

Size.—A tumor reaching midway between the symphysis and umbilicus may be successfully treated by radiation unless pressure symptoms exist, for these tumors of long standing with compression of the adjacent viscera had better be treated surgically. Some operators will not treat tumors whose size exceeds that of a four months pregnant uterus, because of the slow retrogression and the possible danger of later degenerative changes.

Rate of growth.—If the tumor grows and the hemorrhage persists, in spite of treatment, a complication, a wrong diagnosis, or a malignancy should be suspected and operative measures instituted. (It has been suggested that a temperature record during the x ray therapy is advisable in the attempt to determine the onset of infection, softening, necrosis or thrombosis.) Small but rapidly growing tumors respond more readily than large, slowly growing tumors.

Condition of tumor.—Necrotic or degenerated myomata, producing cachexia and toxemia from absorption and an anemia out of proportion to the menorrhagia, are best treated by operative procedure. So also are tumors showing calcareous degeneration and characterized by intense menstrual and intermenstrual pain. The existence of an associated malignancy is not always an indication for operation.

COMPLICATIONS.

FUNCTIONAL.

Menstruation.—In rare cases severe hemorrhages may require immediate treatment and unless contradindications exist, operation is indicated.

Pressure.—Severe pressure symptoms demand quick relief and therefore indicate operation.

Pregnancy.—Is a distinct contraindication to röntgen therapy of myoma, for the pregnancy may be interfered with and fetal development disturbed.

ORGANIC DISEASE.

The presence of an associated acute or chronic adnexal inflammatory condition is a direct contraindication to the treatment. Severe anemia and myocarditis, either as a result of the myomata or the hemorrhages, are conditions which indicate the necessity of radiation, particularly when the hemoglobin falls as low as twenty-five per cent. In these cases, in order to avoid the increase in bleeding after the first series, a larger dose than usual should be given. (Hemotherapy either by drugs or transfusion preliminary to the x ray treatment has been suggested.) Diseases of the heart, lungs, liver, kidney or bloodvessels are indications for the application of radiation in fibroids.

TECHNIC.

The old technic of many small fields has given way to the more modern method of large fields and heaver filtration. The results with this latter method have been very striking. The complete dosage may be administered in one to four sittings and rarely is more than one series necessary.

The Coolidge tube is energized with a peak voltage of two hundred thousand, with five milliamperes of current at a focal distance of thirty-five centimetres.[4]

The ray is filtered through one millimetre of aluminum and five tenths of a millimetre of copper. The treatment is adminstered through four fields, two abdominal and two dorsal, each on either side of the median line in four sessions in two to eight days at the end of the menstrual period. Fifty per cent. of the full skin dosage is applied to each portal. In many cases this treatment is followed by complete cessation of menstruation, even in women under thirty. In some cases the exposure must be repeated but only a smaller dose is then necessary. While the tumor and the hemorrhage may be controlled by frequent and continued small doses, nevertheless the complete dosage applied within a short period has many disadvantages from the viewpoint of accuracy of dosage and economy of means and time. The systemic effects during and after radiation are not more severe, if the proper technic is used, than with the older methods.

Where only radium is available it may be used as a substitute for x rays in the treatment of myomata and myopathic hemorrhages with the limitations above enumerated. Fifty mg. of radium, properly filtered, are inserted into the uterine cavity, for twenty-four hours or less, depending on the age of the individual. It may be definitely stated that for the purpose of producing menopause the x ray is superior as a therapeutic agent to radium.

The results to be expected from radiotherapy are:

1. *Cessation of the bleeding.*—When the bleeding is very excessive and time is a factor, operation is indicated. The hemorrhage due to fibroids should be treated by radiotherapy in those women in whom a permanent menopause is not objectionable. In younger women, up to the age of thirty-eight, the resultant premature menopause must be considered unless a surgical operation is contraindicated. The contraindications (phlebitis, obesity, anemia, disease of the heart, lungs, liver and kidney), which before radiotherapeutic days were considered, but nevertheless risked, should now be considered as indications for the nonoperative treatment. While the menopause symptoms are not desirable, they are to be preferred to any operative risk, for they can be fairly well controlled by organotherapy. Fibroids in a woman over forty should be treated only by röntgen therapy. While the tumor and the hemorrhage may be controlled by frequent and continued small doses, nevertheless, complete doses should be applied quickly for the avoidance of prolonged period of attendance and to prevent the development of complications.

2. *The shrinking of the growth.*—This shrinkage is a slow process, though it begins almost immediately. Marked shrinkage following radiation occurs in about sixty per cent. of the cases. The extent of the shrinkage depends both on the age of the tumor and the age of the patient.

3. *Improvement in the general condition,* the cessation of pain, the relief of insomnia, the cure of the constipation, an increase in weight and general increase in vigor definitely follow in the cases in which the treatment is effective.

With the older method of administration of the radiation through many fields at a distance of twenty-three centimetres with a nine inch gap and five ma. and filtration of four mm. of aluminum the result of the first series is rarely an amenorrhea without return, usually an increase of symptoms, with increased and profuse menstruation, or no change at all. The result of the second series is usually an amenorrhea, sometimes a marked diminution in the flow or no change.

The result of the third series is usually amenorrhea in women over thirty or the treatment is ineffective.

Two or three series are usually necessary to obtain the desired result. With the modern method if the radiation is applied in the first half of the intramenstrual period, the desired effect is produced after the first series.

In the myofibrosis cases, with diffuse thickening of the uterine wall, the effects may not appear after the first session but always after the second.

When the cases are properly selected and all proper indications exist and the technic is properly carried out, the desired clinical result, namely ammenorrhea, diminution in the size of the myomatous uterus, frequently a restitution to normal and disappearance of all symptoms, is obtained in one hundred per cent. of the cases.

Generally speaking the röntgen method of treatment has its disadvantages as well as advantages. The gynecologist should weigh these in determining the method of treatment to apply.

ADVANTAGES.

1. The treatment is painless.
2. There are no failures in the properly selected cases.
3. The menopause is not usually attended by any

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[4] The transformer apparatus used consists of two separate closed core transformer units, energized in parallel and capable of producing a voltage of 300,000. There are two rectifying mechanisms, one for each of the transformers. The current is so rectified that both impulses are delivered unidirectionally to the terminals of the tube, while the ground potential is maintained between the two transformers. The rectifying mechanism consists of a cross-shaped mica spider at the ends of which are mounted the segments and conducting strips. The frictional resistance of this form of commutating switch is much less than that of a full circular disc of the same diameter, which permits both discs to be mounted on the opposite ends of a single motor shaft. The voltage control consists of a heavy variable ballast resistance in the primary circuit. The filament transformer is provided with a voltage stabilizer. Damping resistances are placed in the secondary circuit for the prevention of surges and for the symmetrical distribution of the load in the circuit.

severe nervous symptoms, the psychical equilibrium is maintained and the vasomotor changes are insignificant.

4. It takes one to eight weeks and if it fails the operation may be carried out under the same conditions as before.

5. There is practically no mortality if the cases are properly selected, while the operative mortality with abdominal extirpation is about three per cent.

DISADVANTAGES.

1. There is a definite time period before the cure is effected.

2. The fibroid may only partially disappear after several months, and in rare cases a recurrence may occur.

3. Malignant changes may be present in the uterus or in the fibroid tumor and overlooked or malignant changes may take place in the fibroid under treatment.

The last is urged as the most important objection to the use of radiotherapy. It is true that a sarcomatous degeneration may, except in cases of rapidly growing tumors, be overlooked in determining the proper treatment. But sarcoma is rare and the danger of operation is surely greater than the possible danger of overlooking a sarcoma. Greater stress is laid on the coincidence of carcinoma or epithelioma with fibromyoma. Though it is obvious that an undiscovered cancer of the uterus will lead to fatal results, unless the radiotherapeutic procedure is especially applied for this purpose, it is also obvious that the discovery of cancer in the specimen after hysterectomy has been performed, presents the problem of surgical treatment in a new aspect.

Just as any form of treatment outlined for the fibroid is altered when the cancer is discovered, so the röntgen treatment must be altered if the response to intensive treatment is such as to indicate that malignancy exists. This phase of the case is in the hands of the gynecologist, whose constant scrutiny of the case by all the available methods will minimize the possibility of an erroneous diagnosis. It must be conceded that where the slightest doubt as to the correctness of diagnosis exists the interest of the patient demands operation followed by immediate röntgenization. Not infrequently are tumors of the ovary radiated in the belief that it is a fibroid, which apparently does not respond to treatment. The crux of the entire treatment of fibroids by this method is correct diagnosis. By that test, the value of this treatment stands or falls. In some gynecological clinics, eighty-four per cent. of all myoma cases are submitted to röntgen therapy. There are still, however, in this country, a number (though rapidly diminishing) of gynecologists, who operate the vast majority of cases and refuse to acknowledge the value of radiation, even now when the consensus of opinion holds that it is the method of choice in the treatment of fibroids.

Carcinoma.

GENERAL CONSIDERATIONS.

Preparation.—The patient with carcinoma, to be submitted to radiation, must be considered in the same light and from the same viewpoint as the patient about to undergo a severe surgical operation, both as regards preliminary management, radiation and postradiation treatment.

It is surprising that this viewpoint is not more generally considered and that patients suffering from a malignant disease are not managed with the same consideration as would be given to a severe surgical condition. It is necessary, firstly, that the patients be primarily put in as excellent a physical condition as possible, both by rest, diet, and the administration of hemotherapy, with the intention of bringing the blood to about as nearly a normal point as possible and of increasing the general resistance and vitality of the individual. An enforced rest in bed, proper regulation of the excretory functions, forced and regulated diet, and the administration of iron and arsenic, preferably by subcutaneous injection, should be instituted. During the treatment there should be rest in bed, liquid diet and thorough elimination. For at least six weeks after the treatment has been completed the patient should be put to bed on a regulated diet, with plenty of fluids and the blood constantly examined and treated.

Technic.—Too great emphasis cannot be laid on the necessity of accurate technic in the application of radiation to the treatment of carcinoma. While in the treatment of nonmalignant conditions, there is considerable latitude in the size of the dose by which the desired effects may be obtained and while no very accurate localization of the radiation is essential, in the treatment of malignancies not only must the type of malignancy be known and the pathological field be accurately topographed, but the dose must be accurately measured so that it is neither too large or small and the quantity received by each particular portion of the body traversed by the ray must be known.

The technic of successful radiation of cancer demands: 1. A radiation of the proper quality and quantity. 2. The administration of the lethal dose of this radiation to all the cancer cells at the varying depths at which they exist. 3. The administration of the dose in such a way that, a, the local resistive power of the normal cells about the tumor are not depressed and, b, the general resistance of the whole organism is not appreciably lowered.

The minimal lethal dose for a carcinoma cell, Seitz and Wintz assert, has been established with a fair degree of exactitude. In terms of surface erythema dose it is ninety to one hundred per cent. At least this quantity of radiation and possibly a minimal lethal dose of 140 per cent. may need to be administered to a particular cell. The aim to administer a lethal dose at the desired depth through a portal as small as possible, to avoid general effects, and at a distance as small as possible in order to shorten the duration of exposure.

The question of dosage of the cancer cell would be a relatively simple matter if the various types of cancer cells all reacted similarly to the radiation. At present, however, with the means at hand the sensibility of the cancer cell may vary from an extreme sensitiveness to absolute radioresistance. Then, also, there are periods when the cancer cell has a low vital resistance, as during the period of karyokinesis. But it is not possible to attack all the cells at this particular period. If the radiosensitiveness of the particular type of cancer cell under consideration were known, if the degree of activity of its karyokinesis could be estimated, or the karyokinetic interval determined, then the cell might be attacked in its vulnerable period, with the particular type of radiation which would be most effective. The vulnerable period is during mitosis and the vulnerable point is the nucleus and the action is on it directly. In other words, growth stops because the nuclear structure is damaged and the action is a physicochemical one, taking place as a change in the atomic structure of the nuclear substance, due to bombardment of the secondary electrons excited by the primary radiation. Though, because of its selective affinity for the radiation, the neoplastic cell will react as indicated, the normal cell, on the other hand, because of its low degree of sensitiveness, is excited to increased cellular activity and plays an important defensive or reconstructive rôle against the activities of the tumor. This defensive or reconstructive power of the normal cell can be inhibited or destroyed by overdosage and cannot be aroused when the general bodily vitality is low. No definite statement regarding the actual dosage necessary in a particular case or for a particular type of tumor can as yet be accurately given and any sweeping statement regarding carcinoma dosage must be taken with caution. The clinical study of the case is now the sole guide in the determination of the size and the frequency of the dose.

In the determination of the focal distance, the size and number of portals, the size of the mass, its location and the size of the overlying and underlying tissue layers must be studied.

Though to those portions of the tumor at the immediate surface or which, by destruction of the skin, has reached the surface, the necessary one hundred per cent. may be administered with ease, the extension of the growth towards the deeper structures, however, creates a problem—that of obtaining as much absorption at the depth as at the surface itself. If the growth in its deeper or peripheral parts receives a dose less than the minimal lethal dose, the effect is to irritate rather than inhibit its extension. The lethal dose can be administered through several portals by crossfire, if the growth is at a considerable depth below the surface, as in the uterus. The nearer the growth is to the surface, the more difficult the technic. Thus, for instance, given a growth having a diameter of five centimetres, and located well below the surface (more than five centimetres) it is possible to administer forty to forty-five per cent. of the surface dose at the required depth through each of the two portals of entry, measuring six by eight centimetres, so that the mass may receive eighty to ninety per cent. dosage, with the focal distance as small as twenty-three centimetres. But when such a mass is superficially situated, a crossfire attack is not possible, because of the resulting necrosis which would occur from overdosing of the normal overlying and underlying tissues. This holds true with greater force when the mass is smaller and situated at or a short distance (one to two centimetres) below the surface. Such a mass cannot be effectively crossfired through two portals at the usual focal distance of twenty-three centimetres.

If the radiation were applied through a single portal, however, at this focal distance, the cells at the base of the tumor might receive only about fifty per cent. of the surface dose, depending on the size of the portal. The upper layers would receive the minimal carcinoma dose of ninety per cent. and heal, but the deeper layers (five centimetres) would be irritated to proliferation. In order to administer a dose of one hundred to one hundred and ten per cent. at a depth of five centimetres through this single portal of six by eight centimetres a focal distance of twenty-three centimetres according to Seitz and Wintz, the surface would need to receive two hundred per cent. with certain skin necrosis.

By increasing the size of the portal to ten by fifteen centimetres at twenty-three centimetres focal distance a dose may be obtained at the required depth which is above the irritation dose but less than the minimal lethal dose and by repeating the dose within two weeks it may be possible to produce some destruction of the carcinoma. Yet this method is uncertain, for in the two weeks' interval proliferation may occur.

However, by increasing the size of the portal of entry and the focal distance, the required minimal lethal dose may be administered. In other words, a minimal dose of ninety per cent. may be administered at three centimetres depth, through fields varying from 108 to 225 square centimetres area, at a distance varying from eighty to one hundred centimetres focal distance. Each case, therefore, requires individual consideration, the mass must be measured and the portals carefully plotted and the dosage at various depths estimated.

CARCINOMA OF THE UTERUS.

Though in some cases of primary carcinoma the tumor in its primary stage is limited to the uterus, in the vast majority of cases, even with small carcinomata, the pelvic lymphatics and lymph nodes are infiltrated. With extensive growths this is always the case. It becomes necessary, therefore, in every case not only to attack the primary growth but every portion of the pelvic structures must be thoroughly radiated, including the lumbar, iliac and sacral and inguinal lymph nodes.

The surgical viewpoint classifies carcinoma of the cervix into operable, borderline and inoperable cases, utilizing the radiation for postoperative treatment in the first group, preoperable treatment in the second group and agreeing to the submission of the third group entirely to the treatment by radiation and electrical means. The radiological viewpoint would consider the first surgical group as clearly defined radiation cases, the second surgical group as radiation cases, to be followed by electrical and surgical treatment, and the inoperable group as radiation cases, to be treated with the aid of electrical means.

The treatment by irradiation is one which demands very careful scrutiny of the patient for a prolonged period, in order to detect the earliest evidence of recurrence, either locally or in the lymphatics. Of the three types of carcinoma of the cervix, the medullary, the ulcerative and the fungating, the former is the most malignant and when submitted to treatment usually already has lymphatic involvement. The radiation of the fungating type is markedly simplified and aided by a removal of the friable masses by diathermy.

In reference to carcinoma of the body of the uterus, the routine may be followed which has been in vogue for the treatment of breast tumors, the radiation being applied before and after surgical intervention of the carcinoma may be treated entirely by radiation. Whether of the cervix or of the corpus, whether prophylactic or radical, the full dosage of the radiation must be applied within as short a period as possible, notwithstanding the reaction of the patient.

Preoperative radiation may be applied either four weeks or four days before the operation, depending upon the extent of the infiltration. If the primary tumor is definitely circumscribed and the proper radiation is applied only with the intent of devitalizing any deposit which may exist in the lymphatics, then the operation may be performed four days after the radiation. When, however, the primary lesion is not localized and there is considerable infiltration in the parametrium and the lymphatics, the purpose of the radiation is only to circumscribe the extent of the growth and devitalize the infiltration in the lymphatics, the operation should be performed four weeks after the radiation. In both instances, however, it is important that the fields be so mapped out on the abdominal wall as to leave an unradiated area in the median line, in order that a clean surgical incision be made possible and that healing of the incision be not interfered with. Recurrences, whether in the uterus, parametrium, vagina or lymphatics, should be treated promptly and vigorously.

The mapping out of the fields and the arrangement of the tube in its proper position should not be done without a careful orientation as regards the situation of the carcinomatous mass. Whether of the cervix or the fundus, the arrangement of the tube in relation to the field and the pelvic structures must be made with the aid of a bimanual examination, with one finger in the vagina over the mass and the other on the abdominal wall. Every portal must be carefully mapped out in this manner.

Seitz and Wintz utilize the voltage corresponding to a sixteen inch spark gap at a focal distance of twenty-three centimetres with five-tenths millimetre zinc filtration, each portal measuring six by eight centimetres, receiving from twenty-five to thirty-eight minutes' exposure, which is repeated after six weeks' interval. The treatment is administered through three fields anteriorly and three posteriorly and one over the vulva. The middle field is located above the symphysis, and somewhat toward the right of the median line. The two lateral fields are placed crossways. When the pelvis is small the lateral fields extend outside the iliac fossa. They seek to obtain a destructive dose which they calculate at 135 per cent. Because in the raying of the primary tumor the rectum receives the full carcinoma dose, 110 per cent., therefore, in the second series the right parametrium is treated first, through three portals in front and three in back. This is done because as there is only six weeks interval between the first and second treatments, it is imperative to avoid injury to the rectal mucous membrane by overdosage. In the third series, when the left parametrium is treated, in the same way through three portals, fourteen weeks have elapsed and the rectal reaction has had time to disappear. If the left parametrium is more involved than the right, then the left must be treated first, regardless of the danger of the rectal mucous membrane. It must be stated that this technic, even if carefully applied, is not usually successful without local radium treatment. The radiation administered through the portals above described appear to be insufficient. Another method is to apply the radiation through four fields, one in front, one behind, taking in the entire pelvic abdominal wall, and one to either side, measuring twenty-four centimetres by nine centimetres at fifty centimetres focal distance, filtering through one millimetre of copper, with a peak voltage of 200,000. The result of the treatment must be carefully studied and radium inserted if necessary.

If the uterus is extensively involved and there is marked infiltration in the parametrium and the glands, both the above methods seems to deliver insufficient dosage.

At least four portals in front, five posteriorly and one over the vulva are necessary. The bladder and rectum are emptied. The pelvis is elevated. The abdominal wall from the symphysis to the umbilicus and as far lateral as the posterior axillary line is mapped out as the field of operation. The curved surfaces of this anterior and lateral portion of the abdominal wall are built up by the use of wet tissue paper, aluminum silicate, or by a compound of paraffin, until rectangular surfaces are obtained. The anterior surface is now divided into four equal portals. The posterior abdominal wall is similarly built up and similarly mapped out. The two lateral aspects are each considered as one portal. And the radiation administered over an additional portal over the vulva with the upper edge of the 6 by 8 cm. field at the lower border of the symphysis. For each of these portals a full dose is made up as follows: the voltage 45 cm. gap between points; filtration 1 mm. copper, 3 mm. aluminum; distance 30 cm. milliamperage minutes, sufficient to administer the maximum dose the skin can safely tolerate—a second degree erythema.

Eight to twelve weeks after an area has been treated the dose is repeated. The frequency of the repetition of the series and the interval between series depends upon the general and local clinical condition and the condition of the skin.

If the treatment is given after surgical operation, the same routine must be used in the application of the rays, subjecting the part to complete dosage in as short a time as possible. Lengthening the duration of the series and insufficient dosage predisposes to fresh invasion. The affected tissues must be completely overwhelmed by the ray.

Radium has its important and valued place in the treatment of carcinoma in association with the x rays. The gamma rays of radium and the x rays are similar agents and equal wave lengths of the same radiation may have the same effect. It is true that the wave length of the gamma rays of radium represent the maximum penetrative power of any radiation now known. To produce x rays having a penetrating power of the gamma rays a Coolidge tube with a voltage of about one and one half million would be necessary.

The intensity of the gamma radiation is, however, exceedingly feeble. So that even though with 220,000 or 250,000 volts a radiation having a penetrating power of the gamma rays is not produced, still there is made up in intensity what is lacking in penetration. The x rays perhaps are the more generally useful therapeutic agent, in that, besides the local action, there is much desired action on distant tissues, for which radium is ineffective. The gamma rays and the x rays now available do not, however, have an identical therapeutic value. The lymphocytes are more readily reduced by the x rays than radium while the cells of the liver and spleen are more susceptible to the gamma rays.

Radium is of great value as an adjuvant in the treatment of carcinoma of the uterus, but the effect on the distant lymphatics and on pelvic metastasis can only be obtained by crossfire by x rays—unless enormous quantities of radium are at hand. Six hundred milligram hours' irradiation with the gamma rays will kill cancer cells for a distance of one centimetre. A dose at least four times as great is necessary if the malignant cell lies at a distance of two centimetres, an extremely unsatisfactory dose quotient, which cannot be increased by increasing the focal distance, due to loss of intensity. Increasing the quantity of radium is likely to produce a burn of the rectal mucosa, which is as sensitive as the carcinoma cell. Unless the tumor is larger than three centimetres in diameter over 100 mg. should not be used and the rectum and bladder must be pushed away. To destroy a cancer of the cervix three centimetres in circumference, 3,200 milligram hours are necessary; one hundred mg. for thirty-two hours. Observations in the dead house on cases of deep cancer treated with radium clearly indicate that without the additional use of x rays, the treatment by radium alone is likely to produce superficial healing with active and progressive infiltration in the depth. In these cases mere reduction in the size of the tumor does not warrant the deduction of the retrogression of the tumor. The effect by this combined treatment, depending on the growth and the reactive powers of the body of the particular case, is either a clinical cure, a prolongation of life and amelioration of symptoms, discharge and pain, or an improvement to such an extent as to make the case easily operable and diminish the possibility of recurrence.

The final verdict regarding the effect of this combined treatment cannot as yet be given. The Wertheim operation in good hands shows forty per cent. (Bonney) of the patients alive after five years. The combined radiation treatment, judging even by present results, will surely better this.

CARCINOMA OF THE VULVA.

The lesions may vary from flat growths three quarters of an inch in diameter to masses half an inch thick by three inches in length. Though the erosion is apparently on the surface, the invasion is through the fascial planes. This infiltration extends beyond the visible evidences of the growth.

Here the method is that outlined with large portals at great focal distances. The field to be treated is blocked out with lead. The target skin distance utilized is from 75 to 100 centimetres, the central ray being directed to the middle of the field. An exposure of eight to twelve hours is given at one time with 200,000 volts.

STERILIZATION.

a. In all but infectious dysmenorrhea, the radiation has the effect of diminishing the discharge and pain. The dose must be carefully applied in order to avoid complete castration. However, when the uterus is infantile, no such contraindication exists and then sterilization may be produced. The degree of permanency will depend upon the age of the individual and the size of the dose.

b. The röntgen treatment may also be utilized after Cæsarean section, where resection has not become a part of the operation.

c. The application of the radiation to the ovary for the purpose of treatment of osteomalacia was first advanced by Ascarelli. Wetterer obtained a marked improvement by systematic x ray treatment. The pains diminish or entirely disappear, motion improves and the general condition improves remarkably. Further bone deformation does not occur but existing bone deformities are not, however, influenced. The treatment is continued until complete and permanent amenorrhea is obtained.

d. Cases of severe tuberculosis or where an operation for carcinoma has been done or where x ray therapy is being applied for carcinoma of the breast, may be sterilized by the röntgen ray effectively. This procedure is to be preferred to the surgical means.

e. The attitude regarding the sterilization for social reasons is rapidly changing. As a rule sterilization may be rapidly accomplished in multipara, when such measures are justifiable and permissible, according to the numerous indications which need not be outlined here.

PRURITUS VULVÆ.

Here the ray should be applied filtered in small dose, with a voltage of 90 to 100,000, three millimetres of aluminum, at thirty cm. distance, one treatment a week. A single skin unit, less than an erythema dose may be sufficient. This should not be repeated until an interval has elapsed sufficient for the subsidence of every trace of reaction. By this technic the production of the desired result, though somewhat delayed, is nevertheless, because of the permanency and the absence of later skin changes, the preferable method of application.

CONCLUSIONS.

Anyone reviewing the rapid progress of the röntgen therapeutic methods in gynecology in the last few years, must be driven to the conclusion that though much has already been accomplished, there is no finality to progress. Considerable modification in the scope and the technic of this form of therapy will undoubtedly take place in the near future. Already a great quota of the cases have been removed from the realm of the surgeon and the solution of the many unsolved problems in technic will surely widen the field of röntgenology.

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Malnutrition in Infancy: A Consideration of Its Various Phases in Relation to Treatment

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The term malnutrition, loosely employed to include the various forms and degrees of nutritional disturbances in infancy, is an indefinite one, and may signify merely an impaired state of nutrition or an extreme degree—athrepsia. In using this term we are influenced by this very fact, since it affords us opportunity to discuss the numerous and varied phases in which this condition manifests itself.

ETIOLOGY.

The wide range of etiological factors places this condition in the foreground as a problem in pediatrics, and it occupies a prominent place in the statistics on infant mortality.

Marfan(1) gives three groups of causes as follows: 1, Faulty or insufficient feeding; 2, affections of the digestive tract, and 3, infectious diseases, especially chronic ones. While this may serve well as a broad classification, we feel that greater detail is necessary for a better understanding of the condition, not only from the viewpoint of the underlying pathology, but in the matter of accurate application of the principles of treatment, since removal of a causative factor is the first step toward successful therapy. While artificially fed infants comprise the greater proportion of sufferers from this condition, the breastfed do not wholly escape, due to a variety of causes other than faulty feeding. In formulating our classification of causes we have laid stress on the diversity of etiological factors applied both to the breastfed and the artificially fed.

Faulty feeding.—Under this heading we include, 1, insufficient food; 2, overfeeding; 3, improper milk mixtures relative to the proportions of constituents, and 4, irregularities in feeding. The total daily quantity of food may fall short of the amount which the child needs for its growth and metabolic activities. As a consequence the deficit is drawn from the body tissues and the general health and nutrition are undermined. Overfeeding is perhaps a greater offense against the body mechanism. Too great a quantity throws additional strain upon the organs of digestion, and as a result there is a prompt disorganization of the body metabolism, with a minimum utilization and storage. Faulty milk mixtures are frequently responsible for digestive disturbances with diarrhea and vomiting, water loss, tissue atrophy and a subsequent state of malnutrition varying from hypothrepsia to one of acute infantile atrophy. There are numerous ways in which an improper formula may bring about these conditions. Excessive carbohydrates, by producing a hyperacid medium in the intestine, cause a fermentative type of diarrhea. An excess of protein renders the medium hyperalkaline and hence conducive to putrefactive changes with concomitant intestinal indigestion and diarrhea. Excess of fat is perhaps one of the most frequent causes of malnutritive states secondary to digestive disturbances. The fatty acids, formed by the action of the fat splitting enzymes, are liberated in abnormal quantity, and as a result, there is a faulty metabolism of fats associated with a loss of alkaline salts, digestion and proper absorption are hindered, and the nutrition fails. An abnormal amount of salts also favors digestive disturbances and exerts a marked influence on the state of nutrition by its effect on the weight and temperature.

Irregularity in feeding.—This is frequently the foundation for digestive disorders and nutritional disturbances. Regularity in the feeding intervals is of prime importance in favoring normal digestion and metabolism. Feeding irregularly at two, three or four hour intervals, without resorting to a definite schedule, will in time produce deleterious effects. The stomach requires a certain length of time in which to empty itself. It is therefore apparent that a feeding given close upon a previous one, before the stomach has emptied itself, will have a tendency to overload that organ and produce vomiting and other symptoms of indigestion. Mothers will frequently state that they feed the child "whenever it seems hungry," utterly disregarding the question of regular intervals. This is especially true in the case of the breastfed. Although an infant, in certain instances, apparently thrives on this *pro re nata* schedule, the digestive and nutritional disturbances usually following in the wake of such a régime speak strongly against it and rather favor the adoption of regular periods.

Faulty hygiene, poor care, and surroundings.—These constitute etiological factors of the utmost importance. We have had under observation many patients who, by their progressive gain in weight and strength under ordinary good care and feeding, with an abundance of fresh air and sunlight, have proved to be of this type. Startling degrees of malnutrition may result from neglect and faulty hygiene. The following illustrative case may help to further impress this point.

Case I.[1]—C. M., a colored female child of two years old, was admitted with the mother's statement that the child failed to thrive, seemed weak, and for the past year had suffered a progressive weight loss. There was no history of vomiting or diarrhea, but the child's appetite seemed poor at times. The family and past history were negative. Close questioning revealed the fact that the mother, being at work during the day, was obliged to leave the child in the care of a neighbor, with the result that the little one was neglected, fed irregularly and without regard to the character of the food, and in a short time was in a state of extreme malnutrition.

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[1] Cases cited were under observation at Children's Hospital, Washington, D. C.

The feeding history showed that the child was breastfed until the sixth month, followed by formula feeding. She gained in weight and appeared to do well until the age of one year. Following this period there was a steady decline in the general health and nutrition. The child, on admission, was extremely malnourished and weak. She could neither sit up nor stand, and was markedly rachitic. She was apathetic and would lie quietly in bed, seldom crying. Skin turgor was poor, and there was extreme muscle and tissue atrophy. The ribs were prominent and there was marked sternal depression. Heart and lungs were negative. The abdomen was tense, distended, and tympanitic on percussion. Extremities were spastic, with well marked prominence of the condyles. The patellar reflexes were exaggerated. Blood examination showed a marked secondary anemia. The Wassermann reaction was negative; uranalysis revealed nothing remarkable; temperature was normal. Weight on admission was ten pounds eight ounces. The stools were normal.

Treatment: The child was first placed on an exclusive whole milk diet, taking six to seven ounces at each feeding and given six feedings daily. The object of this was to determine the tolerance and digestive powers. The stools were carefully examined for evidences of excessive fermentative or putrefactive changes but at no time were there any manifestations of digestive disturbances. The weight, however, remained stationary for several days. At this time cereals were added to the diet, following which there was a gain in weight. In addition to the increased food intake the child received daily inunctions of olive oil. Three weeks after admission she was on a full diet for the age, and was making steady gains in weight. There was marked improvement in the general appearance, she seemed much stronger, was soon able to sit and stand unsupported, became playful, and upon discharge (two months later) weighed fifteen pounds and fourteen ounces, and was in excellent condition.

The absence of any acute or chronic infectious disease, the lack of evidence of digestive disturbances, and the almost immediate reaction to good hygienic care and proper feeding (manifested by rapid and steady gains in weight and strength) make it apparent that neglect, poor environment and faulty hygiene constitute the etiological factors here.

Digestive disturbances.—Disturbances arising from overfeeding or an excess of fat, carbohydrate or protein, are frequently the causes of rapid loss of weight and the associated signs of hypothrepsia and athrepsia. As has been stated, fat indigestion is probably the most frequent form, while the changes incident to excessive carbohydrate or protein feeding act as comparatively less common causative agents. The rôle of the salts as a primary etiological factor has not been definitely established. According to Morse and Talbot (2) "it is difficult to determine whether the disturbance of nutrition is due primarily to a disturbance of the salt metabolism from an insufficiency or an improper combination of the salts in the food, or whether the disturbance of the salt metabolism is secondary to an insufficiency, excess, or improper combination of one or more of the food elements and to the disturbance of digestion caused by them." The promiscuous feeding of proprietary foods without regard to proper dilution is another frequent cause of digestive disorders. Disturbances of digestion in the breast fed are not as common as in the artificially fed, and are usually the results of the ingestion of excessive amounts of breast milk, or of a breast milk too rich in one or more of the constituents. Indigestion following disturbed functions of the nervous system is not infrequent, and is usually traceable to extremes of temperature, lack of rest and sleep, and noisy surroundings.

Prematurity and inherited feeble constitution.—These are important causes of malnutrition. Cook (3), in a study of seventy-seven premature infants, found that hemorrhage, nephritis, toxemia, syphilis, heart disease, tuberculosis, alcoholism and neurotic conditions in the mothers constituted the chief etiological factors. He states that the average weight was 2090 grams. The usual weakness and low tolerance for food in these infants make the feeding problem extremely difficult, and obviously predispose to states of malnutrition. The same applies to infants born at full term but with a feeble constitution, the result of some underlying maternal or paternal disease or both, chief of which are syphilis and tuberculosis.

Acute and chronic diseases.—Of such diseases to which disturbances of nutrition may be secondary, probably the most common are pyelitis, otitis media, ileocolitis, pneumonia, skin affections (notably eczema), syphilis, tuberculosis and rickets.

Parenteral infections.—These often constitute the underlying etiological foundation for severe secondary digestive and metabolic disorders, with subsequent loss of weight, diarrhea and marked disturbances of nutrition. Pyelitis, otitis, rhinopharyngitis and bronchitis are commonly the offending agents, and the resulting digestive and nutritional disturbances cannot be successfully treated until these infections are eradicated. In a recent study of a series of cases (4) we laid great emphasis upon this point regarding its etiological rôle in the digestive and metabolic disorders of infancy. The following case is illustrative:

Case II.—E. D., a white female child of six weeks, admitted with complaint of loss of weight and diarrhea. Her weight on admission was eight pounds nine ounces, and she did not appear to be very ill, being fairly well nourished and with only a slight pallor of the skin. There was no vomiting, but the stools were frequent, loose, and green, with moderate amounts of undigested food. Following mild purgation she was put on a casec mixture, two ounces every three hours, with rather prompt improvement. There was a gain in weight, the stools became less frequent, and there was a marked improvement in the general condition. Ten days later a whole milk formula was substituted, and the child gained rapidly and was in excellent condition. Two months later she developed a nasopharyngitis which was promptly followed by symptoms similar to those for which she was admitted. The weight dropped rapidly, the stools became frequent, watery, and undigested, and there was a decline in the general condition. Numerous milk mixtures were tried with no effect. With a subsidence of the infection, however, there was decided improvement. The diarrhea ceased, the weight began to rise and she continued to do well on an ordinary whole milk formula.

Congenital defects and malformations.—Cleft palate, harelip, tongue tie, atresia of the esophagus, hypertrophic pyloric stenosis and similar defects and malformations, not infrequently give rise to serious disturbances of nutrition by the mechanical prevention of proper ingestion and assimilation of food. The last mentioned condition is perhaps the most difficult to deal with from the viewpoint of medical treatment. Surgical correction of these defects is productive of excellent results in many cases.

Habitual vomiting (rumination).—This may be mentioned here as a not uncommon factor in inducing impaired states of nutrition, sometimes to an alarming degree.

Greene (5), in a comprehensive review of the literature on chronic diffuse nephritis in childhood, states that the most striking feature in many of the case histories was the report that the child was delicate from birth, and that a chronic nephritis of greater or less severity, existing at birth, could well be the cause of a severe grade of nutritional disturbance. While this is a comparatively uncommon etiological factor, it should, nevertheless, be given careful consideration, since congenital disease, unrecognized, will act as a barrier to therapeutic measures aimed at a *condition* rather than at a *cause.*

PATHOLOGY.

Concerning the pathology of these nutritional disturbances, much has been written. The opinions of various investigators differ in some respects, but the work of Marriott (6), Howland (7) and Schloss (8) in this country stands out notably. Marriott (6), in a recent study including a review of the literature on this subject, has brought forth some noteworthy data. From a review of his work and that of other investigators, the following appear to be the outstanding pathological features in the severe cases: 1. Acidosis, due to failure of the kidney to excrete acid phosphates which are found in the serum in increased amount. 2. Excessive weight and water loss. 3. An excess of urea and total nonprotein nitrogen in the blood, reduced phenolsulphonephthalein excretion in the urine, and an abnormally high Ambard coefficient (Schloss). 4. Scanty, highly concentrated urine. 5. A diminished total blood volume, a low rate of blood flow, and a high cell count and hemoglobin content on the capillary side. 6. Fever, in many cases, due to water evaporation. 7. A low oxidizing power of the body cells and a breaking down of body tissues. 8. A negative nitrogen and salt balance caused by tissue destruction, which, in turn, is the result of dehydration. 9. Anhydremia with increased blood protein concentration. These constitute the predominating pathological processes in the cases of socalled athrepsia. In simple, uncomplicated malnutrition, however, the picture is different, since the nutritional disturbance is not active in so marked a degree.

CLINICAL CLASSIFICATION AND SYMPTOMATOLOGY.

For clinical purposes we are inclined to favor Marfan's (1) classification. He mentions two distinctive types: 1, The milder form (hypothrepsia), which he subdivides into two degrees, and 2, athrepsia, the extreme type.

Concerning the former he states that the adipose tissue usually disappears first from the abdomen (first degree of hypothrepsia), and then from the trunk (second degree of hypothrepsia). When the extremities and face become involved, athrepsia is the term applicable. The milder type is characterized by a gradual weight loss, a loss of subcutaneous fat, a dry skin with diminished elasticity, secondary anemia, and a loss of the digestive and assimilative functions.. The child is restless and fretful and attacks of indigestion with diarrhea are frequent. The temperature is usually subnormal. There is a marked predisposition to infectious diseases. Food tolerance is lowered, and, in short, there is a disturbed balance. The urine may contain an excess of chloride, phosphates and urates. The stools may contain an excess of neutral fat, or may be characteristic of fermentative or putrefactive changes.

The clinical picture of athrepsia is much more startling. The weight loss is rapid and progressive. The temperature is at first subnormal, but later, as dehydration becomes more marked, hyperpyrexia intervenes. The features are sharply drawn, the fontanelle is sunken, there is marked tissue atrophy, and the skin assumes a leaden hue. The extremities are cold and often have an accentuated bluish color, due to marked venous stasis. Not infrequently there is edema of the tissues. Dehydration is characteristic. The blood picture reveals a high cell count and hemoglobin content. The stools are usually small, containing undigested food residue. Where diarrhea is a complicating factor they are frequent, watery, and contain large amounts of mucus. The urine is scant and concentrated. Bedsores readily develop, commonly upon the occiput. A toxic purpura, when present, is invariably the sign of a fatal termination. Keratomalacia is an occasional complication, of which Ross (9) reports four cases. As the condition progresses nervous symptoms may develop, usually manifested by a series of convulsive seizures. A terminal infection, commonly bronchopneumonia, is the more usual manner of exodus.

PROGNOSIS.

This depends, 1, upon the underlying etiological factors; 2, upon the extent of the pathological processes involved; 3, upon the presence or absence of complications, and 4, upon the institution of prompt and energetic treatment. In the mild, uncomplicated cases, with special attention to the character of the food and with good hygienic care, the prognosis should be favorable. In the severe cases, however, where there has been extreme weight loss and tissue atrophy, where dehydration is marked and where complicating infections are present, even with rigid treatment the prognosis is decidedly grave.

TREATMENT.

The literature on the therapeutic aspects of nutritional disorders in infancy reveals numerous methods and modes in vogue, a wealth of suggestions regarding the feeding problems, and a choice menu of food mixtures, varying from the ordinary milk and protein milk formulas to the recently heralded butter flour preparations (Czerny-Kleinschmidt).

While the results reported in many cases would lead one to rejoice in the discovery of a supposed panacea, statistics, upon close analysis, fail to convey any information whereby one may draw definite conclusions as to the merits of the treatment in question. The reason for this is obvious. It is unreasonable to expect certain food mixtures, drugs or other measures of therapy to bring about favorable results in every case. It is only by the selection of suitable cases for the particular form of treatment that one can hope to obtain a successful response. A certain formula, productive of good results in the case of one infant, may have an entirely opposite effect when fed to another suffering apparently from the same malady. The reasons can be found by an analysis of the underlying etiology in each case, the relative powers of the functions of digestion and assimilation, and the physical makeup of each infant. The tendency is to treat the disease from which the little patient is suffering by certain therapeutic measures advocated for that condition, disregarding the child as an individual unit. In brief, Dr. A says: "I am using this food preparation in my cases of malnutrition because Dr. B has used it in many of his cases, with excellent success." But were Dr. A's cases of the same types as Dr. B's? Perhaps Dr. B's were dependent upon a primary digestive disturbance due to excessive carbohydrate fermentation, while Dr. A's were suffering from protein indigestion. In the case of Dr. B the treatment is probably based on sound scientific principles, while Dr. A is groping in the darkness of chance. The point we wish to emphasize is that the patient must be individualized and treated as a distinct entity. This we regard as one of the most important essentials toward successful results in therapy.

A discussion of treatment for almost any condition is incomplete without a few points on prophylaxis. Especially is this true of these nutritional disturbances, in view of the diversity of etiological factors. Since breast milk is, under ordinary conditions, the normal food for infants up to the tenth month, it follows that the maintenance of breast feeding is the first important step in preventing nutritional disorders which commonly follow premature weaning. In some cases circumstances are such that early weaning becomes a necessity; in many instances the mother is at fault; and not infrequently the physician is culpable. Sedgwick (10), in an attempt to stimulate breast feeding in Minneapolis, found that out of over one thousand women leaving the hospital, all of them were nursing their babies, thus disproving the idea that mothers often do not have any milk for their newborn babies. The mothers of practically every baby born in Minneapolis were followed for nine months. It was found that at the end of that period over seventy-two per cent. were still nursing their babies. This would appear to suggest that a great proportion of artificially fed infants, in many instances, have been needlessly weaned earlier than is conducive to normal development and nutrition. The number of cases of malnutrition in the breast fed is relatively low; hence, whenever possible, we should employ measures to stimulate and maintain breast feeding until the proper time for weaning.

When, however, definite indications arise which make it imperative that an infant be weaned early, the problem of adequate and proper feeding is one which often taxes the ingenuity of even the most careful practitioner. The utmost care and attention to every detail concerning the character and preparation of the food, the institution of a regular feeding schedule, and particular attention to the hygienic care of the infant are essential preventive measures against threatening nutritional disturbances. This again brings up the question of environment and the practicability of the application of these principles of prophylaxis. In many instances one is handicapped by the ignorance, indifference and carelessness of the mother, while in some cases the surroundings and living conditions are incompatible with proper care of the child.

Regarding these obstacles, the solution lies largely with the physician. It is incumbent upon him at least to make an attempt to remove them. This introduces the social service aspect, which we shall not discuss here.

Relative to the curative treatment three golden rules suggest themselves, which stand out prominently against a background of therapeutic fallacies: 1, Individualize the patient; 2, determine, if possible, and eradicate the underlying cause or causes; then 3, treat the condition according to definite indications, employing only such remedies as will produce a maximum effect toward a successful result. The following case is illustrative not only of a combination of etiological factors but also of certain therapeutic aspects.

Case III.—E. C. E., a colored, male child of eight months was admitted in a condition of marked emaciation, the mother stating that for the past month the child had suffered from diarrhea, vomiting, and a rapid loss in strength and weight. The family history was negative. The child was born at full term; delivery was normal; birth weight not recorded. He was breastfed until the age of six months, and during that time appeared to thrive. At this time, due to the mother's poor physical condition, he was weaned and placed on formula feedings. The mother could give no accurate information as to the character and amount of milk which he was taking. She also stated that home conditions were such that he was often neglected and fed irregularly. He did poorly and had frequent attacks of vomiting and diarrhea, losing considerable weight up to the time of admission.

Physical examination revealed an emaciated child, crying feebly, and apparently very weak. Tissue atrophy was marked, skin turgor was lost, the fontanelle sunken, and the cheeks hollow. Ears, nose and throat were negative. The ribs were prominent and beaded. Heart and lungs were negative; the abdomen was scaphoid. Slight spasticity of the extremities was present, with marked thickening of the epiphyses. Blood examination showed a moderate secondary anemia, and the urine a trace of albumin. The stools were loose, greenish yellow and sour smelling, containing small amounts of mucus but no blood. The temperature was subnormal; weight, seven pounds, fifteen ounces. A bottle of water offered was taken greedily, as was also a small quantity of diluted milk.

From a careful examination and analysis of this case we concluded that the underlying causes of the child's condition were 1, faulty feeding; 2, faulty hygiene and poor care, and 3, digestive disturbances resulting from these. The problem of hygiene and care was solved without difficulty, since the nurses in charge were highly efficient. The question, however, of how to facilitate a return to normal of the digestive and metabolic functions was not answered quite so readily.

Considering the metabolic, digestive and assimilative powers at zero, we decided to try a gradual adjustment by starting with a high milk dilution and gradually increasing both quantity and quality. We began with a one third milk formula, allowing a relatively small daily intake, with a low caloric scale. No sugar was added until the sixth day. Increases were made every two or three days as long as there were no symptoms of digestive disturbances. In short, we were testing the food tolerance. The child took all that was offered, and cried lustily after each feeding, apparently hungry. Vomiting ceased and the stools became less frequent and of better consistency. We maintained, however, the gradual increase, in spite of a drop in weight during the first few days. The weight curve showed a fluctuation during the first thirteen days. At this time the weight was eight pounds and four ounces, showing a gain of but five ounces. The temperature during this period never rose above 97°.

On the assumption that a prevention of increased heat dissipation might aid in stimulating metabolic activity and thereby increase heat production, the child was placed in an incubator (11) heated to eighty degrees. The weight increased from this point, although the temperature of the child did not rise above 98°. During the third week a half ounce daily of cream of wheat was added to the diet, which was well tolerated. Daily inunctions of olive oil were given, and the weight rose rapidly. The child was discharged on the thirty-eighth day weighing ten pounds, eight ounces, and markedly improved in general health.

Comment: The system of feeding which we employed in this particular instance is absolutely no indication that its use in other cases of malnutrition will bring about similar results. It is merely an example of selective therapy applied to an individual case.

In the more usual typical case of athrepsia, assuming that the etiological basis has been satisfactorily dealt with, how shall we proceed further in combating the extensive pathological changes? As a preliminary measure the intestine should be purged free of irritating material, and for this purpose castor oil holds first place. Within eight to ten hours later a high colonic irrigation with normal saline serves as a valuable adjunct to a thorough cleansing of the intestinal tract. We do not advocate a starvation period in these severe cases, since clinical observation has failed to reveal any material benefits from it. Feeding should be started at once, and, if available, breast milk is the food of choice, beginning with a half dilution and gradually increasing the concentration. This should be given in small amounts and at frequent intervals. If breast milk cannot be obtained a one third boiled skimmed milk formula may be substituted.

Where an infectious diarrhea is the underlying etiological factor, the type must be determined and the feeding modified accordingly. If a bacillary dysentery is the primary causative agent high protein feeding is contraindicated. Carbohydrate is then necessary, and this may be added to the skimmed milk in increasing quantities. A gas bacillus infection, on the other hand, calls for a relatively high protein and low carbohydrate feeding. Lactic acid milk is beneficial in this type of case. When a fermentative diarrhea is the prevailing factor protein milk should be given, regulating the quantity and sugar additions according to indications, the stools serving as the important guide. There are many preparations on the market conforming more or less to the Eiweiss milch of Finkelstein. The percentages of fat, carbohydrate and protein are approximately the same in all, the protein ranging from three to 3.4 per cent. The fat content is about two per cent. and the carbohydrate about 1.5 per cent.

To replace excessive water loss fluid must be given in sufficient quantity to compensate the dehydration. These may be introduced by mouth, subcutaneously or through the intraperitoneal route. As these infants usually take little by mouth, and since absorption is slow through subcutaneous administration, intraperitoneal injections have enjoyed great popularity as the most efficacious means. Concerning this method Gittings and Donnelly (12), Moore (13), and Blackfan and Maxcy (14) have had success in a number of cases, using from two hundred and fifty to four hundred c. c. of normal saline. There is little doubt that this is a quick and efficient method of fluid introduction. But its good effects are often counterbalanced by harmful reactions attending the injections of excessive quantities. We have seen improvement in many cases following the injections of small amounts of fluid not exceeding one hundred c. c. We have also noted severe reactions in the same type of case shortly after the introduction of three hundred to four hundred c. c., characterized by vomiting, convulsions, and symptoms of respiratory embarrassment. Observations in a number of cases have led us to believe that better results are obtained by repeated injections of small quantities (one hundred c.c. as a maximum) than by flooding the peritoneal cavity with excessive amounts.

The arguments in favor of this are based upon the perverted physiological functions and the pathological processes associated with these severe nutritional disturbances. With a circulation at its lowest ebb, with a greatly diminished blood volume and low rate of flow, with a heart feebly maintaining its function and with the excretory powers of the kidneys at zero, why throw an additional strain upon an already exhausted mechanism by the introduction of overwhelming quantities of fluid? Is it not more logical to assume that a gradual replenishment by small amounts at intervals would be of greater effect in bringing about a recovery of circulatory balance? The injections of small quantities of fluid plus conservative circulatory stimulation by the hypodermic route will have a much better effect in the direction of recovery than a determination of the fluid capacity of the peritoneal cavity! Pressure on the diaphragm, caused by filling the peritoneal cavity to the point of marked abdominal distention is another significant argument in favor of the conservative method. Blood transfusions may prove of benefit in some cases. In one little patient three transfusions were done with the father as donor, but the effects after each were temporary, the child dying within two days after the last.

Where the temperature is subnormal, external heat should be applied either in the form of hot water bottles or by placing the infant in an improvised incubator. When, however, there is a hyperpyrexia due to dehydration, repeated cold sponging is decidedly advantageous as a controlling measure.

As to drugs, only a few are necessary, and these, when used, should be given in sufficient doses to insure effect. Do not prescribe a drug that is indicated in a dose that would scarcely bother a mosquito. One minim of the tincture of digitalis given every four hours to an adult with a severe lobar pneumonia would obviously have little or no effect. Give a drug for its good effect and give enough to obtain that effect! Brandy, caffeine and camphor are excellent stimulants in these cases. For controlling convulsions chloral and bromides per rectum are of great benefit. Paregoric is a valuable aid in cases associated with diarrhea and tenesmus. Morphine, in carefully graded doses, may be administered hypodermically, and is indicated where the desired effect is not obtained with paregoric. Regarding the intestinal astringents and antiseptics, in some instances they appear to be beneficial to a minor degree. However, in the majority of cases they possess little value in modifying or controlling severe diarrheas.

The treatment outlined for these various forms of malnutrition is applicable, within certain limits, to the types of cases which are commonly met with. The modification of routine therapeutic measures depends upon the individual case presenting special symptoms which demand special treatment. The different phases of the subject of malnutrition are open to much discussion from numerous angles of thought. We have endeavored to lay particular emphasis on the highly important relationship between the etiological and therapeutic aspects. It is only by a thorough consideration of all the underlying factors entering into the production of these nutritional disorders, and a careful application of the principles of treatment based on a solid foundation of common sense reasoning, sound judgment and scientific acumen that one can hope to achieve any measure of therapeutic success.

References will appear in the author's reprints.

Artificial Infant Feeding for the General Practitioner*

By RALPH J. MELMAN, M.D.,
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I selected this subject, first, because I thought it would be of interest to every general practitioner at all times; secondly, because of its seasonal importance. I have also tried to make this paper as practical as possible, and let me hope that I have succeeded to some extent in doing so.

In general, artificial feeding can be defined as the substitution of mother's milk by any food capable of supplying to the growing infant the nourishing principles of a suitable quality and in quantities sufficient, not only to maintain life, but also to provide for normal growth and development. It would not be amiss to consider the reasons for artificial feeding; and, for that purpose, I have divided them into three groups, according to the frequency in which they occur.

1. Insufficient breast milk for any reason, either in quantity or quality. This as I have proved to my satisfaction is in the majority of instances only a desire on the part of the mother to see her child grow big and fat. She succeeds sometimes in obtaining the consent of her family physician to take the infant off the breast and put it on an artificial food. As I have been told on many occasions "My doctor told me that my milk is watery, or I have not a sufficient supply." In such cases the statements of the mother as to the poor quality or insufficient quantity of her milk must first be verified. This can be accomplished, respectively, by a qualitative analysis of her milk, and by weighing the infant before feeding and then during feeding at five to ten minute intervals for twenty-five minutes, and observe the difference in weight. This repeated on several successive days will give us an indication as to the supply. Provided the milk is of good quality, the infant should not be taken off the breast entirely, even if the supply is deficient; but, supplemental feeding should be instituted instead, because artificial food, at its best, cannot be compared to human milk. It is important to have some breast milk in cases of an acutely ill infant, and in some cases the milk supply increases when breast feeding is continued. The method of supplementary feeding is carried out as follows: If the child needs, let us say, four ounces, and the mother can only supply two ounces (by actual observation), some mixture containing two ounces is given following the breast.

2. Economical conditions compelling the mother to be away from the child the major part of the day. This is, to my mind, the most important reason justifying artificial feeding.

3. The condition of the health of the mother. Such diseases as syphilis, tuberculosis, cardiac and renal disease, which are contraindications for continuing breast feeding.

The last two groups comprise the majority of instances where we are compelled to place the infant on some form of artificially prepared food, and the proper selection is of the utmost importance, for on it depends the life and future welfare of the infant.

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*Read before the Medical League, April 24, 1922.

Before going over the methods of selecting the proper food, it is worth while to call attention to the fact that in recent years we do not meet with as many acute gastrointestinal conditions in infancy, even during the hot summer months, as we used to. We do not see as many terrible cases of marasmus, scurvy, and other conditions of malnutrition as formerly. How can this be accounted for? Is it new ultrascientific methods of feeding which the general practitioner follows, that so noticeably reduced the infant mortality, or is it the discovery of a new proprietary or patented food that was instrumental in this matter? I do not believe it is either, for a great number of infants are still being fed on about the same substitutes as formerly.

The only factor that really was instrumental in ameliorating the conditions influencing the life and development of the child, was the education of the mother. The medical profession aided by the child's welfare societies, health centres, child's hygiene organizations, and other institutions, such as The Babies' Hospital, with which it is my privilege to be connected, have done remarkable work in that direction, and accomplished phenomenal results. They have taught the mother how to take care of a child's hygiene and diet; instructed her as to how to clothe the infant in the different seasons of the year, the importance of frequent bathing, of cleanliness, of fresh air, and other important factors. She was trained to prepare and how to preserve, for a period of the day, the child's food. She was also instructed as to the amount of food to be given at a certain age, and the necessity of regularity of feeding. She was taught to eliminate certain proprietary, patented, and table foods.

All these precautions are undoubtedly responsible for the great decrease of infantile diseases and mortality. Of course, the best sanitary attention alone, without proper food, would be worthless. So, in cases where the infant cannot, for one reason or another, enjoy its mother's milk, we are called upon to prescribe some other food.

In selecting a food for an infant in a poor home, several factors must be considered: First: Nutritive value of food given. Second: The time consumed in preparing, and the ease with which it can be preserved; for a poor mother who usually has several other children has not the time or patience to prepare a complicated formula. Third: The intelligence of the mother; for in some cases, no matter how simple the mixture given may be, it appears complicated.

There is no question that cow's milk differs from human milk in the percentage of its food principles, especially in the sugar and proteins, for cow's milk consists approximately of four per cent. of fat, four per cent. of sugar, and four per cent. of proteins, and human milk has three to four per cent. of fat, five to seven per cent. of sugar, and one and one half to one and three fourths per cent. of proteins. It also differs in physical and chemical properties, and for these reasons you meet with failure in a small percentage of cases. However, it can be very easily modified, so as to be made suitable for infant feeding, and it will still retain its advantages over proprietary foods. Milk, as a food for infants, is richer than any other food in nutritive value. It is a household necessity, for in the poorest home you can find some milk. It is easily preserved by keeping on ice, which is also a household necessity, and it does not require much time or great intelligence to prepare.

In selecting cow's milk I prefer certified milk. I also instruct the mother to follow certain rules:

1. To get seven bottles, and I tell in detail how to take care of same.
2. To feed the infant at intervals of three hours, and to give a bottle of boiled water between feedings; also commencing at the age of one month, to give one teaspoonful of orange juice twice daily at 8 a. m. and 4 p. m., well diluted with water; and increase the amount with the age of the child.
3. The infant should get one ounce more than its age in months, until it reaches the eighth month; and, following this principle you will prevent vomiting from overfeeding, and other gastric disturbances in a great number of cases.
4. To prepare the mixture in the morning for a twenty-four hour supply. This saves time, and prevents contamination.
5. Instruction of position of child and bottle while nursing. The kind of nipple to use is important; and care should be taken that the nipple does not collapse. These last may sound of minor importance, but they must be carefully observed to obtain good results.

The diluents we use are boiled water in cases where the digestion is normal; barley water where there is diarrhea; oatmeal water in cases of constipation; and in exceptional cases vegetable extracts.

As to the actual preparation of the mixture, let us take for illustration an infant of one month, which would require seven feedings of two ounces each, amounting to fourteen ounces in all; the percentages we commence with (by actual experience) should be one and onefourth per cent. fat, five per cent. sugar, one and onefourth per cent. proteins. In this formula, we sacrifice the fat to get a fairly workable percentage of proteins. In prescribing the formula I try to avoid fractions of ounces whenever possible and therefore this formula would read five ounces of milk, eleven ounces of diluent, and four level teaspoonfuls of sugar.

A simple way to figure sugar is as follows: The sugar percentage in the mixture always equals the protein and fat percentages, and as I stated above cow's milk contains roughly four per cent. of each ingredient. In this case the sugar would be 1.25 per cent. You would therefore have to add about four per cent. sugar to make up the five per cent. we desire, which is approximately four teaspoonfuls.

We now tell the mother that if the child does not vomit, and the stools are good, she should add half an ounce of milk every ten days and deduct a half ounce of diluent. In this manner, at the end of the second month, the child would take six and a half ounces of milk and nine and a half ounces of diluent, and the same amount of sugar, i. e., four teaspoonfuls, which would approximately be 1.6 per cent. of fat and 1.6 per cent. of protein; but, the child is two months old now and would require three ounces at each feeding instead of two, so that a change would have to be made in the quantity, but not the quality (I do not increase both at the same time). Therefore, the formula would call for nine ounces of milk, thirteen ounces of water, and six teaspoonfuls of sugar, for seven feedings, and by increasing half ounce of milk every ten days, until at the end of three months the infant will be getting 1.9 per cent. of fat, and 1.9 per cent. of protein. We repeat this process until the fifth month, when the substitution of a half ounce of diluent by milk for diluent is performed every five days, instead of every ten days; and at the end of nine to ten months, the child would take whole cow's milk. I also gradually commence to feed the child on cereals and vegetables at the seventh month.

We sometimes have to modify our procedure in regard to percentage of the different ingredients, and also in the form of sugar, but in general this procedure is a good basis to work on. It is also worth while to point out the remarkable intolerance some infants have for sugar, contrary to former teachings that sugar was never a cause for gastrointestinal disturbances in infancy.

We occasionally meet with absolute failure in a few cases, but these are mostly cases where the infant has had a bad start, either by overfeeding, causing a chronic dilated stomach, or improperly prepared food, causing an impairment of activity of the whole gastrointestinal apparatus.

In conclusion, let me hope that I have at least partially succeeded in impressing upon you that with a very moderate amount of skill and care, we can feed our poor patients' infants successfully, prevent still more of the digestive disturbances and their sequelæ, and diminish infant mortality.

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The Drug Addict

By JAMES A. HAMILTON, Ph. D.,
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Drug addiction is not a disease but a pernicious habit; and drug addicts are much the same in prison as out of prison. They are all the same wherever you find them when they are being taken off the drug: mean, contemptible, selfish, and as arrogant as conditions both inside and outside the institution will permit them to be.

The public hospitals in the city of New York treated drug addicts by a method, which at that time was supposed to be the most humane way of handling these people. It was not a failure so far as the treatment was concerned. The inmates were relieved of their drug addiction and it was demonstrated to them that they were able to live better without the drug than with it. It was a failure in this respect: that public officials became disgusted with the drug addict and his arrogance, which seems to have been fostered by the wails of sentimentalists who preached "the unfortunate drug addict," and developed for him a sympathy far beyond his deserts.

The treatment of drug addiction is bound to fail in public hospitals unless some custodial power is given to officials of these institutions, and until the public in general realizes the true condition of drug addicts and treats them as they properly deserve; but so long as drug addicts are permitted and encouraged by people who create wrong impressions, to make a bedlam of hospitals, just so long will the treatment of drug addiction in institutions other than penal be a failure.

The past few years have been fruitful as far as the study of drug addiction is concerned. We know now that the hospital equipment need not be so elaborate. Drug addiction as viewed by the medical profession is not a disease as they recognize disease, but a habit, the symptoms presenting being a result of the inhibitory action of the drug on the functions of the organs.

Drug addiction is a most pernicious, degrading and degenerating practice, and if persisted in, no drug addict fails to become degenerate physically, mentally and morally. As far as being statistically a criminal, it is my opinion that every drug addict is a potential criminal. The lack of criminal acts in the socalled respectable drug addict results from his ability to obtain the drug. Let him be deprived of the drug by lack of funds or opportunity, and you will find a criminal who will stop at nothing to obtain his supply.

We know of no drug addict who is innocent. All continue this degenerating vice wilfully, the majority refusing to be cured; and their real criminal status is often only a matter of a few dollars.

It is remarkable that while some people are so interested to keep the socalled respectable, innocent drug addict away from the criminal, the criminal is just as anxious to be kept away from the contemptible "hophead" or "cokie" as they call them.

It is a noteworthy fact that inmates of a prison will estimate a man's true character quicker than all the social workers, parole officers, judges and even psychologists. The criminals in prison do not agree that the drug addicts may become contaminated by association with them; but they shun the drug addict as one not fit with whom to associate.

There is not in any treatment anything which prevents a recurrence. All treatments simply take the addict off the drug, and it is purely a matter of selfcontrol whether he returns to the habit or not.

All debates or discussions relative to the control of drug addiction sooner or later become acrimonious disputes between medical men as to the merits of their respective treatment. In this way the doctors have unintentionally befuddled the real issue, which is not *treatment* but *prevention of drug addiction.*

Drug addiction will never be eradicated by treatment. Prevent the drug addict from getting the "stuff" and there will be no necessity to worry about what kind of treatment is the proper one.

Editorial Articles

THE EXPERT MEDICAL WITNESS.

The oft discussed problem of the expert medical witness is once more placed in the foreground of medicolegal interest by an article in the *American Bar Association Journal* by C. E. McBride. There can be little argument as to the desirability of altering existing conditions, from a public spirited point of view no less than from narrower reasons concerning the medical profession. Mr. McBride gives expression to views widely held by the laity as well as members of the bar. His "experience has taught" him that an opinion favorable to the selecting party is assured beforehand, and that in all problems arising subsequently the experts are influenced by the fact of their employment for the purpose of holding and maintaining a specific opinion. This process robs them of the impartiality expected from the lay witness, and, *ipso facto,* reduces the value of their testimony. He states: "The present system of presenting the testimony of experts is poorly calculated to assist in arriving at the truth; that the witness has invariably given assurance that he will swear to an opinion favorable to the party calling him and usually receives a fee proportionate to his estimate of the value of his opinion to the side for which he testifies."

Such abuses would, of course, in the end bring discredit on all concerned and thus defeat their own aim. Mr. McBride continues: "Expert opinion evidence has been used so much that it is viewed with a great suspicion by both courts and juries; "and "it has become very plain that where opinion evidence is admissible" it is open to any attorney to procure the "opinion evidence desired by paying the market price thereof."

In fairness and justice to the much maligned medical man a number of plain facts should be urged upon the attention of the accusers. To begin with, he is as likely as not busily engaged in the pursuit of his professional duties and resents the court service imposed upon him as a disturbance rather than welcomes it as an opportunity for conspiring against the aims of justice. Further, he may be innocent of the more subtle points involved in his own testimony. Is it not the case that the difficulty to arrive "at the truth" is inherent in the formulation of the questions to be answered by the expert, rather than in the manner in which the evidence is given? If that is so, the blame must clearly be affixed to the legal member of the combination.

Another consideration deserves careful attention. We refer to the obvious fact that where there is room for the expression of opinion there must also be occasion for honest differences of opinion. Members of our own profession cannot lose sight of this truism, for discussions at meetings and in the literature vividly reflect the clashes of hypotheses and of interpretation. Few practitioners of the art and science of medicine can be narrow enough to become unconscious of the "art" element of their work. It would be an error to expect recognition of this fact among the laity. The public is prone to conceive medicine as a rigid system of scientific discipline. It would be a herculean task to banish the idea that a phenomenon has but to be observed to call forth the correct application of the one and only scientific knowledge. When the opinion of the doctor is solicited, his answer is expected to be dogmatic and unhesitating. This deeply rooted human conception was no doubt responsible for the delightful regulation in the Egypt of antiquity that no blame was attached to the doctor upon the death of his patient, if he had employed the "right" treatment. If, on the other hand, his therapeutics had not been in strict compliance with "the book," the prognosis for the doctor was unfavorable. While our present viewpoint allows more latitude for individuality, the fact remains that even the instructed laity will look askance at differences of opinion where medical problems are concerned.

Under these circumstances Mr. McBride's reforms have obvious merit, though we may quarrel with his premises. He suggests first that the expert witnesses be selected by the court. Such a step would, indeed, mark a distinct improvement, particularly if the court assumes responsibility for the evidence to be submitted to the expert. There may be some objections to such a measure. The characteristics of the medical expert would be in danger of partaking of the qualities of both judge and jury under the new arrangement. On the other hand, parties will claim the privilege to adduce the conclusions of an expert who may have special qualifications in the medical domain under discussion, and whose deductions may altogether, and honestly (!), differ from those held by the forensic court expert. Who would deny this right to any of the parties concerned?

Mr. McBride's second reform deals with the payment of the expert witness. He suggests that his services be paid for by the state or county and that his fee be made part of the costs of the litigation. This aims at making an end to the supposedly fabulous sums paid to medical experts in consideration of the "direction" of their opinions. While, alas! this simple remedy would not necessarily reduce dishonesty to the status of a forgotten rumor, we venture to think that the medical profession would endorse the measure suggested. The reform would secure for them at least some assured compensation for the time spent, and they would have the satisfaction of having their public status safeguarded to a certain extent from hasty censure and partisan cynicism.

SODIUM OLEATE IN THE PHENOMENA OF SHOCK.

When 1.5 c. c. of one per cent. solution of sodium oleate is injected into the jugular veins of sensitized guineapigs it has been shown that the animals can afterwards tolerate without any appreciable disturbance an injection of an antigen lethal for the control animals. These experimental proofs were carried out by Kopaczewski and Vahram in their researches on the prevention of anaphylactic shock (*Academie des Sciences,* August 4, 1919). This protective action has been attributed to the property possessed by sodium oleate of diminishing the superficial tension of the fluids to which it is added. The experiments of Lumière and Couturier (*Academie des Sciences,* September 26, 1921) relating to the mechanism of the development of anaphylactic paroxysms are not in accord with this explanation so that these observers have endeavored to analyze this phenomenon of protection by the following method:

In the first place they studied the action properly belonging to sodium oleate on normal subjects. If the dose injected into the jugulars is progressively increased, more and more intense anaphylactoid accidents develop and the animals die after two c. c. of a two per cent. solution of the oleate have been introduced into the circulation. When the arterial system is used—carotid or left heart—the doses necessary for producing the accidents or for causing death are much less. With a concentration of about 1:1000, an injection of one c. c. will hardly have been given before the animal has convulsions, falls inanimate, and dies in less than a minute. If only 0.5 c. c. of the 1:1000 solution is injected the ensuing accidents are comparable to those met with in anaphylactoid shock, but death does not usually follow. Weaker doses produce various disturbances, but always recall anaphylactoid crises by their modality.

It is likely that sodium oleate gives rise to a flocculate when combined with the calcic compounds of the blood, which for that matter can be directly revealed, and which result in the development of the symptoms of shock, in exactly the same way as the precipitate of barium sulphate does in normal animals or the second injection of antigen in anaphylactized animals.

Sodium oleate is one of the most potent substances for lowering the superficial tension, hence by itself provokes the phenomena of shock. When the sodium oleate solution is mixed with the antigen or barium sulphate, the ensuing shock will be aggravated; it should, on the contrary, be attenuated if the drop in the superficial tension possessed any action. Sodium hyposulphite prevents the shock of the oleate just as it does other shocks, while ligature of the carotids delays its development and considerably attenuates it.

In order that the immunizing power of sodium oleate shall manifest itself, it is necessary that the product shall be given in a sufficiently small dose and some little time before the provocative injection is given. In these circumstances it will prevent the occurrence of true anaphylactic shock, as well as barium shock and other anaphylactoid shocks. It acts in the same way as the subintrant injections, advised by Besredka, by accustoming the endothelium of the cerebral vessels to irritation resulting from precipitates.

Inversely, if with all due precaution inert bodies are introduced into the circulation, such as flocculated barium sulphate, or if anaphylactized animals be vaccinated by Besredka's method, one may afterwards administer with impunity several lethal doses of sodium oleate. All flocculated or flocculating products can be substituted for each other to provide protection against fatal shock provoking injections of any one of them. The study of this particular case, therefore, again confirms the theory formulated by Lumière for explaining the phenomena of shock.

SCOLIOSIS.

Confession is good for the soul, and confession of ignorance is particularly beneficial to the medical mind. "The problem of scoliosis is ever with us," and it is refreshing, even if a bit disheartening, to read the rest of the sentence from the Sixteenth Report of Progress in Orthopedic Surgery: "The satisfactory explanation of its etiology is still lacking in the majority of cases. We may call it constitutional, 'idiopathic,' functional, developmental, or whatever we choose, but these terms do not explain."

The editors of the report have more to give us than negative information. "It is clear," they say, "that posture alone does not cause it, nor short legs alone, nor vertebral anomalies alone. Rickets, we know, is associated in certain younger patients in an apparently causal relation. We believe that we must assume some condition of the bones of a similar nature to that in rickets before a poor posture, or a short leg, or a vertebral abnormality can act as an exciting cause." Which all goes back to the condition which we have many times emphasized as at the bottom of so many of our physical maladies—malnutrition, meaning by that much more than lack of weight.

By way of cure for scoliosis we have had many "systems" of exercise put forward cocksurely, though, from personal witness, we must say with doubtful effect. Mountains of plaster have been applied in jackets which have given abundant distress to the wearer. The patients have been hung up by the head—held in overcorrecting frames—and what not. All in good faith—following some leader who believed he had the right idea. The editors of the report, continuing their confession, say: "We seem to be able to arrest, perhaps improve, the condition in certain cases of considerable severity. It has not been yet proved beyond cavil that we can untwist and unbend, much less correct, the curvature in cases in which there is a fixed rotary curve, without danger to the general health and the possible production of other deformities out of all proportion to the advantage of the correction of the curvature."

The candor of this confession of the orthopedists is enviable; others might emulate their example. In the meanwhile, we expect to know more of the cause of scoliosis through the efforts of such students, and something as to its prophylaxis, if not its cure.

RELATIONSHIP BETWEEN ERYTHEMA NODOSUM AND TUBERCULOSIS IN CHILDHOOD.

The relation of erythema nodosum to tuberculosis in children has given rise to considerable study of late, although this etiological problem has not been definitely solved. Erythema nodosum is frequent in children over the age of five years and also is met with in young people and adults. It presents the clinical aspect of an eruptive infectious process with an evolution divided into three phases—invasion with fever, eruptive phase, and terminal phase. Unquestionably there is a period of incubation, but it is not clearly understood. In some patients there are precursory thermal rises, anorexia and emaciation, but these phenomena are not constant. Contagion is exceptional.

Fever marks the onset, ranging between 101° to 102.5° F., and is irregular without anything pathognomonic. The patient feels tired, has headache and insomnia and from the anorexia emaciation occurs. Constipation is more prone to arise than diarrhea. This phase lasts for five to ten days and no diagnosis can be made until the erythema appears. Then the temperature increases and rather severe pain is complained of in the lower limbs and often in the joints. The eruption at first appears around the knees and anterior aspect of the leg where it is prone to localize, but it extends to the thighs, the gluteal region and the arms, rarely to the trunk. The eruptive element is composed of a nodosity firm to the feel, round or oval, more or less voluminous, painful on palpation, and projecting slightly under the skin. The integument covering it is violet red and this color momentarily disappears upon pressure by the finger. Histologically it is an edematous process with perivascular leucocytic infiltration in the skin and subcutaneous tissues.

At the end of a few days the spot no longer becomes effaced by pressure, it becomes of a bluish, greenish, yellowish color, its consistency decreases and by softening absorption takes place. A slight desquamation of the epidermis occurs. In eight or ten days the eruptive element will have disappeared but new crops appear, with recrudescence of the fever and pain for another eight or ten days, and finally the process subsides after an average duration of fifteen to twenty days. Relapses are rare, recurrences exceptional. Convalescence is long and the child recovers slowly.

The diagnosis of erythema nodosum is usually easy, but it may be mistaken for several affections, particularly polymorphous erythema, and there is a question as to whether the two processes are not the same. The majority of dermatologists admit that erythema nodosum is a variety of polymorphous erythema, the two being united by intermediary forms. However, in the latter variety there are spots, papules, bullæ and vesicles scattered about everywhere on the cutaneous surface, while in erythema nodosum the nodules are hard and painful with a special localization around the knees and over the tibia.

The etiology of erythema nodosum has been differently interpreted. For some it is a manifestation of rheumatism or of an infectious pseudorheumatism; for others, it is a process similar to eruptive fevers. Certain observers regard it as being dependent upon various infections, such as gonorrhea, syphilis, paludism, septicemia or tuberculosis, and it is this question of the relationship between the two affections that is at present so much discussed.

Erythema nodosum has been seen to develop in subjects with unquestioned tuberculous antecedents or in individuals suffering from pulmonary, bone or lymph node tuberculosis, or it may begin as a primary affection in subjects apparently free from tuberculosis, yet in whom this disease develops soon after. In some instances tuberculosis and erythema nodosum have undergone their evolution simultaneously, while in others the appearance of the tuberculous symptoms or their recrudescence has taken place at the time of defervescence and disappearance of an erythema nodosum. Of course tuberculosis often develops after many febrile processes common to childhood, but in all the tuberculosis stamps its mark by a manifest evolution, such as meningitis, pleurisy and tracheobronchial adenopathy. The likeness existing between the temperature of primary erythema nodosum and febrile states, likewise primary in appearance, create very strong presumption, not to say certitude.

Histology and bacteriology have not furnished sufficiently demonstrative results. Blood taken directly from the veins and inoculated has always given negative results. The cuticle and intradermic reactions have sometimes been positive, which merely implies that the subject has a focus of tuberculosis somewhere in his body. However, various experimental data combined with clinical observation seem to show that some cases of erythema nodosum have a tuberculous origin, because other erythemata may result from various infectious processes.

COLDS, COMMON COLDS.

There are three maladies coincident with civilization, which, collectively or alone, are a sad commentary on that word. Like this term of which we are so unreasonably proud, they are named with words which begin with the same letter. They are colds, constipation, and caries. It would be difficult to decide which of these three c's causes more discomfort, loss of time, and waste of money. Any hint which is of help in diminishing their frequency is worth grasping at, if it prove but a straw.

A writer in a recent number of the *Lancet* describes the pathology of colds as of three stages which are reached in as many successive days. The first is the condition of irritation of the mucous membrane of the nose—the sneezy state. On the second day fever is present, while, if the condition continues, there is, on the third day, a condition of purulent discharge.

We are more interested in his observations of the results of treatment. For the conditions existent on the first day, he has found that a brisk walk for an hour in the open air is most effective. If the symptoms do not disappear and the cold progresses to the feverish stage, he puts the patient to bed for twenty-four hours. If a cure does not result, treatment is practically of no avail, as nothing seems to influence the disease after it has reached the stage of purulent discharge.

Most unfortunate for the physician, who would test the prescriptions for the first two days of this illness, the patient seldom appears until the third stage has been reached. It would be difficult also to persuade more than a small percentage of those who came earlier that the suggestion of an hour's walk or a twenty-four hours' stay in bed was worth paying for. Probably a majority of cases of so-called colds treated in this country are prescribed for by the drug store clerk, and we may be sure that rest or exercise will be the last things to be dispensed from a pharmacy.

Vaunted cures of colds in any stage, by means of drugs, are exceedingly doubtful. There is very frequently an apparent relief. The nasal discharge may be checked, the fever may disappear for the time, but in a day or two, one or both have returned and the cold drags on through its later stages, possibly longer for the depression which resulted from the early drugging. If the attack can be broken up by something more physiological—by muscular exercise or rest—these should, by all means, be tried.

FIRST REPORT OF COMMITTEE ON MUNICIPAL HEALTH DEPARTMENT PRACTICE

One of the outstanding events of the fiftieth annual meeting of the American Public Health Association, held in New York, November 14th to 18th, was the presentation and acceptance of the first report of the committee on Municipal Health Department Practice, a reprint of which has recently been issued. The pamphlet gives in condensed form the results of surveys of the health departments of eighty-three cities of the United States of a population of one hundred thousand and over. The committee announces the publication next fall of a more detailed report in book form, which should be of great value.

It had long been realized by public health workers that authentic information concerning municipal health departments of American cities was sorely needed, and that a collection of data on the current practice of the larger departments would amply repay the effort. Accordingly, in 1920, the Metropolitain Life Insurance Company agreed to finance such an investigation, provided that the American Health Public Association would be responsible for the gathering of the information and the preparing of the report. The association accepted the offer and appointed a committee consisting of the following members: Professor C. E.-A. Winslow, chairman; Dr. Charles V. Chapin, Dr. Wade H. Frost, Dr. Donald

B. Armstrong, Dr. Allen W. Freeman, Dr. Louis I. Dublin, and Dr. Lewis R. Thompson.

The committee presents a summary of its findings under the following main divisions: 1, The health board and the health officer; 2, expenditures of health departments; 3, control of communicable disease; 4, tuberculosis; 5, venereal disease; 6, infant hygiene; 7, school medical inspection; 8, industrial hygiene; 9, special clinics; 10, public health nursing; 11, public health laboratory; 12, milk inspection; 13, food and drug inspection; 14, sanitary inspection and sanitation; 15, water supply; 16, sewerage and sewage disposal; 17, publicity and public health education; 18, vital statistics.

The development of the venereal disease clinic service was one of the most encouraging facts revealed by the survey, for practically every large city is now provided with such a service. Infant hygiene work was also done in all of the cities studied, although less than half of the health departments had a distinct division of child hygiene. The lack of good obstetrical care was to be noted, even in the large cities. Better control and training of midwives is an urgent need. Public health laboratory service was found to be well developed and under expert direction.

The need of the moment is to make the physician use more fully the facilities at his disposal. Milk control is exercised by practically all cities, but pasteurization was found to be general only in the larger cities. Only about thirty cities have a grading system. It was found that in the allotment of the health budget the tendency was to appropriate too much for food and sanitary inspection, and too little for tuberculosis, venereal disease, and infant welfare. A striking feature in the control of communicable disease was found in the diversity of practice in the various communities of isolating the same disease. Many of these are faulty and out of date. A crying demand is for public health education. While public health educational facilities are becoming more and more widely available, they are by no means as yet reaching the public to a really productive degree.

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News Items.

School for Blind in Armenia.—A school for the blind, the first of its kind in Armenia, will be opened in Alexandropol, Armenia, this summer by the Near East Relief under direction of Dr. R. T. Uhls, of Kansas City, Mo. The pupils will be 150 Armenian war orphans, aged five to fourteen years. Most of them are victims of trachoma, the dreaded eye disease which is the scourge of the Near East. It will be called the Cleveland House, because the city of Cleveland has provided funds for its maintenance.

Activities of French Hospital Ship.—The French hospital ship, *Ste. Jeanne d'Arc,* after visiting 111 ships, distributing forty-one telegrams, and 6,928 letters, giving medical attention to eighty-four sick fishermen and collecting 3,287 letters for transmission to France, returned from a busy twenty days on the Grand Banks, where she cruises every year looking after the comforts of the French fishermen.

American Urological Association.—At the annual meeting of this association held at Atlantic City, May 26th to 28th, officers for the coming year were elected as follows: President, Dr. Henry L. Sanford, of Cleveland; vice-president, Dr. James A. Gardner, of Buffalo; secretary, Dr. Homer G. Hamer, of Indianapolis, and treasurer, Dr. James B. Cross, of Buffalo. Rochester, Minn., has been chosen for the place for the next annual meeting.

Meeting of the Medical Society of the Missouri Valley.—The annual meeting of the association will be held in St. Joseph, Mo., with Dr. Paul E. Gardner, president, in the chair, on September 21st and 22d. The Buchanan County Medical Society is preparing for a series of clinics to be held at the various hospitals of St. Joseph on Tuesday and Wednesday, preceding the meeting, September 19th and 20th. Complete programs will be ready for distribution on September 1st and the secretary of the society, Dr. Charles Wood Fassett, of Kansas City, Mo., will be glad to send copies to all who are interested.

Personal.—Dr. David Lazarus, 327 Central Park West, New York, announces his departure for Europe on August 19th, for the purpose of further study in surgery, gynecology, and obstetrics. He will return in 1923 and resume his practice in New York.

Professor E. George Payne, of St. Louis, will conduct a course in accident prevention at New York University during the coming year.

Dr. Wilbur C. Smith will be the new athletic director at Tulane University, as well as professor of anatomy in the college of medicine.

Dr. Josephine Baker, of New York, has been appointed by the League of Nations to membership on an important committee on health, the first woman to be identified with the league in an official capacity.

State Sanitary Officers' Association.—At the annual conference of the sanitary officers and public health nurses of New York, held in Saratoga Springs July 27th to 29th, the following officers were elected: President, Dr. Stanton P. Hull, of Grafton; first vice-president, Dr. Garys Masillon Lewis, of Vernon; second vice-president, Dr. Charles D. Kline, of Nyack, and third vice-president, Dr. Albert C. Johnson, of Gloversville; treasurer, Dr. Myron M. Metz, of Williamsville, and secretary, Dr. Montgomery E. Leary, of Rochester. Dr. Florence L. McKay, director of the new division of maternity, infancy and child hygiene of the state department of health, announced that the department is now ready to offer assistance to cities, villages or districts that may desire to undertake local campaigns for the protection of the health of mothers and children.

Deaths from Alcoholism Increase.—According to the records of Dr. Charles Norris, chief medical examiner, deaths from acute alcoholism in New York have increased this year twenty-seven per cent. over last year, and eighty-nine per cent. over 1920. These figures include only those victims who died without medical attention, and Dr. Norris thinks that many others attended by private physicians have died from the same cause.

Increasing Length of Life in the United States.—According to the life tables for the year 1920 for the original registration states just constructed, there has been an increase of two and three quarter years in the life span in the last twenty years, 1901-1920. The complete expectation of life at birth is now 54.3, which in 1910 was 51.5 and in 1901, 49.2. In the last two decades there has been added five years to the expectation of life, and the span of life has been lengthened by a fifth in less than one generation.

Two Chairs Founded in the University of Cincinnati.—Two chairs in the University of Cincinnati College of Medicine, honoring John D. Rockefeller and Andrew Carnegie, were founded at a meeting of the board of directors on July 19th. The professorship in obstetrics will be known as the John D. Rockefeller Chair of Obstetrics and the professorship in biochemistry as the Andrew Carnegie Chair of Biochemistry. Dr. William Gillespie holds the chair of obstetrics, and Albert Prescott Mathews, Ph.D., is professor of biochemistry.

Accident Fatalities in the United States.—Our extreme prodigality with most things is carried out in our wastefulness with human life. The number of deaths due to what we term accidents each year is twice as high in proportion to our population as the number prevalent in countries such as England and Wales. Even though the year 1920 for the United States Registration Area had lower accident rates than any year in the decade, there were in that year 30,000 more deaths than would have occurred if the death rates of England and Wales had prevailed, which means for the entire country an excess of about 37,000 deaths. There is a much higher prevalence of all types of accidents in the United States than in England and Wales.

A Course in Physiotherapy.—A course in physiotherapy, covering a period of one year, will be offered at the Walter Reed General Hospital, Washington, D. C., beginning October 2, 1922. Credit will be given for previous training in physical education, nursing, physiology, and anatomy, so that the course may be completed in six months or even less. The schedule of subjects includes all branches of physiotherapy, and in addition lectures will be given on general hospital subjects. Accepted candidates will be listed as student aides, and will be furnished quarters, rations, laundering of uniforms and $15 a month. No tuition fees are required. Graduates will be eligible for positions in the physiotherapy department in army hospitals, and are expected to serve one year. Graduate aides in army hospitals are provided quarters, rations, laundering of uniforms, and are paid a base salary of $60 a month, plus the congressional bonus of $20 a month. Application blanks will be mailed on request.

Tuberculosis in Canada.—The Saskatchewan Antituberculosis Commission, in making a survey of the status of tuberculosis in that province, found some alarming conditions. The survey covered a number of groups, including 1,500 children of school age or under, 200 normal school students up to seventeen years of age, Indians in boarding schools, Indians in ordinary schools, rural children from three typical sections of the province, and children from three representative city groups. In these groups there were found over 1,600 active cases receiving partial care from 408 doctors. Over half the white children at school were infected with tubercle bacilli, and among the Indian children at the Indian schools the number infected was twice that of the white children of the same age found infected.

Medical Women's International Association.—The second meeting of the Medical Women's International Association will be held at Geneva, Switzerland, September 4 to 7, 1922, under the presidency of Dr. Esther Lovejoy. All members and prospective members are urged to be present. Each society of medical women is invited to send one eligible delegate, and an additional delegate for every hundred members. Interesting reports will be read by medical women from different countries, and the constitution of the organization will probably be revised in accordance with the provisions under which it was adopted. Dr. Martha Welpton, of San Diego, Cal., the corresponding secretary of the association, will be glad to furnish additional information upon request. The officers of the organization are: President, Dr. Esther Jovejoy, of New York; first vice-president, Dr. Christine Murrell, of Hyde Park, London; second vice-president, Dr. L. Thuillier-Landry, of Paris; third vice-president, Dr. Christine Munch, of Christiania, Norway; recording secretary, Dr. Marie Feyler, of Lausanne, Switzerland; corresponding secretary, Dr. Martha Welpton, of San Diego, Cal., and treasurer, Dr. Ellen C. Potter, of Philadelphia, Pa.

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Died.

Barclay.—In Biarritz, France, on Tuesday, July 25th, Dr. Harold Barclay, of New York, aged forty-six years.

Fisher.—In Buffalo, N. Y., on Monday, July 17th, Dr. W. Hurd Fisher, aged twenty-five years.

Geib.—In Stamford, Conn., on Saturday, August 5th, Dr. Henry F. Geib, aged seventy-five years.

Goodman.—In New York, on Wednesday, August 2nd, Dr. Jacob J. Goodman, aged sixty-six years.

Granger.—In Squirrel Island, Me., on Sunday, July 30th, Dr. William Davis Granger, of Bronxville, N. Y., aged seventy-five years.

Lawless.—In New York, on Thursday, July 27th, Dr. Robert Francis Lawless, of Stamford, Conn., aged forty-two years.

Loughran.—In River Bank, Conn., on Saturday, August 5th, Dr. Frederick William Loughran, of New York, aged fifty-four years.

Morrow.—In Braddock, Pa., on Wednesday, July 5th, Dr. Frank Lester Morrow, aged thirty-three years.

Quinlan.—In New York, on Sunday, August 6th, Dr. Edward Fowler Quinlan, aged seventy years.

Rooney.—In Wrington, Somerset, England, on Monday, July 31st, Dr. Alexander Joseph Rooney, of Brooklyn, N. Y., aged eighty-five years.

Wynn.—In Banff, Alberta, Canada, on Monday, July 17th, Dr. Frank Barbour Wynn, of Indianapolis, Ind., aged sixty-two years.

Book Reviews

NEW HORIZONS.

Clinical Tuberculosis. By FRANCIS MARION POTTENGER, A. M., M. D., LL. D., Medical Director, Pottenger Sanatorium for Diseases of the Lungs and Throat, Monrovia, California. With a Chapter on Laboratory Methods by JOSEPH ELBERT POTTENGER, A. B., M. D., Assistant Medical Director, and Director of the Laboratory. Second Edition. Volume I: Pathological Anatomy, Pathological Physiology, Diagnosis, and Prognosis. With One Hundred and Five Text Illustrations and Charts, and Six Plates in Colors. Pp. 707. Volume II: Complications and Treatment. With Sixty-five Text Illustrations and Charts, and Four Plates in Colors. Pp. 725. St. Louis: C. V. Mosby Company, 1922.

Symptoms of Visceral Disease. A Study of the Vegetative Nervous System in Its Relationship to Clinical Medicine By FRANCIS MARION POTTENGER, A. M., M. D., Medical Director, Pottenger Sanatorium for Diseases of the Lungs and Throat. Second Edition. With Eighty-six Text Illustrations and Ten Color Plates. St. Louis: C. V. Mosby Company, 1922.

Pottenger has written more than a textbook on tuberculosis. He has presented a major subject of medicine in a fashion that is as far superior to the older methods of presentation as the airplane is to the oxcart. For the sake of future medicine, may his example be followed! The laboratory, the dissecting room, and the pharmacopœia have been assigned to their proper places and the patient has been considered first of all. The patient is considered as an integrated entity who is confronted with many serious problems, physical and psychical, and whose strivings for a solution for these problems have placed certain stresses on certain segments of the organism and it is these stresses with their pathological manifestations which are worthy of consideration. Every system and every organ of the body are given consideration jointly and in their interrelations. Pottenger is never satisfied with a mere positing of things as they are found; he always asks "why?" This method of approach will bring us nearer the truth and help us to understand better the how and wherefore. The technical findings of the various diagnostic and therapeutic measures are not lost sight of but there is always an effort to correlate and to construct. Special stress has been laid on the neural mechanisms of the organism, the sympathetic, the parasympathetic and the associate systems, and the workings of these systems during a tuberculous infection has been considered in great detail. The endocrines also have been considered with some care, each gland being taken up in turn and the interactions of the endocrine chain as well.

FRANCIS MARION POTTENGER, M.D.

As Pottenger states, "The systemic treatment of the tuberculous patient can scarcely be said to have received serious consideration until the last quarter of a century; and even during this period it has received far less than its importance demands." It is not alone the systemic consideration which merits attention but the patient, his ego and his problems. This is the next step and the most important one. Pottenger has not overlooked it.

There are more detailed studies on tuberculosis but none so complete. A careful study of this book will not only give a complete working knowledge of the processes and complications of tuberculosis and how best to handle them, but will also give us an insight into any other pathological process which may be found in the human body.

Many carefully worked up case histories with extensive yet comprehensive charts are given. The manner in which these are handled are worthy of praise. It is not to be understood that theory has replaced practical points, for Dr. Pottenger in his successful handling of many tuberculous patients, realized the importance of the many details which require attention in order to make treatment successful, to avoid discussing them in his book.

On the whole it may be said in truth that this book is a great addition to the literature not only of tuberculosis but of medicine as a whole. Physicians will do well to read it carefully. They will be stimulated, benefitted and enabled to increase their scope of usefulness.

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The first edition of Pottenger's *Symptoms of Visceral Disease* brought before the medical profession a new way of presenting symptomatic material. The book contained a great deal of stimulating material, but there was much that could be modified and changed as time brought new methods, new discoveries into this rapidly changing field. Pottenger has proved himself fully qualified for this task by the material in the second edition of this book.

The literature on endocrinology has been carefully gone over and the most important points where they concern the vegetative nervous system and general nerve response under normal or pathological conditions have been emphasized. In many instances the text has been clarified with no especial modification of the text.

Of prime importance is the general attitude of looking upon the functional as the most important factor in diagnostic procedures in place of the older anatomical attitudes.

Physicians who wish to be helped or to receive ideas along lines which will aid them in the consideration of the finer diagnostic (and the more important) aids, so that symptoms will have a more vital meaning to them will do well to study Pottenger's book. Not merely read it, but study it.

SKIN DISEASES.

Diseases of the Skin and Eruptive Fevers. By JAY FRANK SCHAMBERG, A. B., M. D., Professor of Dermatology and Syphilis, Graduate School of Medicine, University of Pennsylvania; Dermatologist to the Philadelphia General Hospital and the Jewish Hospital. Fourth Edition, Thoroughly Revised. Philadelphia and London: W. B. Saunders Company, 1921. Pp. 626.

The first edition of this work appeared thirteen years ago and at once found favor with the medical profession of the country, a high opinion which it has never lost despite the appearance of numerous other works on the same subject. The author's plan of including a study of all blemishes of the skin, whether dermatoses or the eruptions accompanying the various fevers and general infections, is a good one from the point of view of differential diagnosis. This present edition has been revised sufficiently to bring it up to date, the eruption in syphilis having received special attention, to the extent of being entirely rewritten. No general practitioner who is looking for a trustworthy guide to the recognition and management of skin eruptions can go far wrong in selecting Schamberg as his mentor.

MENTALLY DEFECTIVE CHILDREN.

Mentally Deficient Children. Their Treatment and Training. By G. E. SHUTTLEWORTH, B. A., M. D., etc., and W. A. POTTS, M. A., M. D., etc. Fifth Edition. Philadelphia: P. Blakiston's Son & Co. London: H. K. Lewis & Co., Ltd., 1922.

Former editions of this book are favorably known to both physicians and teachers interested in the training of mentally defective children. The growing recognition of the need of special educational methods in dealing with this class of unfortunates makes another edition of this work most welcome. The changes in the present edition consist in certain additions to the text relating to mental tests, psychotherapy, and criminal procedure, and a few changes in the illustrations. The pathology of mental deficiency is only touched upon to supply a few practical hints which may be of service to the medical man in his diagnosis, prognosis and recommendations, emphasis being placed rather upon special educational methods such as may be of value to those engaged in the practical work of managing mentally defective children. Their many years of experience in this field make the views of these authors worthy of study by both physicians and teachers.

PUBLIC HEALTH INSTRUCTION.

Health and Disease. Published by the SOUTH DAKOTA BOARD OF HEALTH. Waubay, 1922. Pp. 176.

This helpful, practical little book bears witness to the strides public health work is making, especially in the West. No better statement of its purpose could be made than that in the foreword: "In the preparation of this book no attempt has been made to present a technical or scientific discourse on any of the subjects discussed. It consists of authentic statements, written in nontechnical language, for the purpose of furnishing to the general public information relative to health and disease, including the causes, symptoms and methods of prevention of the most important preventable diseases occurring in South Dakota. It is presented to the public by the State Board of Health for the purpose of increasing individual cooperation with health authorities in the control of preventable diseases, and furnishing the average citizen with knowledge which will enable him to assist in the protection of the health and to promote the efficiency of his family, his community and state."

There are eleven chapters, each dealing with some broad aspect of health. How to Keep Well tells about the value of fresh air, food, exercise, etc., and gives suggestions about clothes, sanitation, patent medicines and accidents. Chapter 3 takes up personal and school hygiene. Other sections deal with communicable diseases, preventable diseases, and disease carrying insects. The final chapter gives brief but comprehensive directions for simple first aid treatment. There is a good index at the end, a feature too often omitted in books of this kind.

The South Dakota Board of Health is to be commended for making so useful a contribution to the cause of public health.

ANATOMY OF THE VISUAL ORGANS.

The Anatomy of the Human Orbit and Accessory Organs of Vision. By S. ERNEST WHITNALL, M. A., M. D., B. Ch. (Oxon), M. R. C. S., L. R. C. P. (Lond.), Professor of Anatomy, McGill University, Montreal; Late University Demonstrator of Human Anatomy, Oxford. Illustrated Largely by Photographs of Actual Dissections. New York: The Oxford University Press. London: Henry Frowde and Hodder & Stoughton, 1921. Pp. xi-427.

The proper recognition and treatment of pathological conditions of the body presupposes an intimate knowledge of both the anatomy of the part affected and the nature of the pathological process involved. This knowledge is of especial importance when dealing with the orbit and its neighboring structures, as their intimate correlations anatomically and pathologically lie often at the basis of diseases of both the orbit and its contents as well as of the surrounding organs. We therefore welcome any work that will help to enlarge and widen our knowledge of these interrelations, and as such we heartily recommend this book. It is a distinctly valuable contribution to the anatomy of the orbit and deserves the attention of both the ophthalmologist and the rhinologist. It presents the results of labor extending over a period of several years, the dissections and preparations having been made by the author himself, and every line bears the imprint of original work by one who has a perfect knowledge of his subjects. The scattered notes of clinical interest interspersed throughout the text add considerably to the value of the book, the literary style of which, by the way, is a distinct and pleasing departure from the hackneyed type of works on anatomy. The contents embrace the following topics: osteology, the eyelids, the globe (external configuration), ocular muscles, bloodvessels and nerves, and an appendix which treats of the cerebral connections of the nerves. A copious bibliography contains a fairly complete list of the papers and books published since 1900 relating to the subject as well as other references of sufficient interest. The general makeup of the book, such as paper, printing, and photographs, is of good quality.

MEDICAL WRITING.

The Writing of Medical Papers. By MAUD H. MELLISH, Editor of the Mayo Clinic Publications. Philadelphia: W. B. Saunders Company, 1922. Pp. 157.

This little book supplies a need the filing of which will be appreciated, not only by physicians, but by all who have to do with the writing, editing or abstracting of medical literature. It is a handbook containing in brief and readily usable form the essential points to be found in general textbooks on the art of writing. It reduces these points to those especially applicable to the treatment of medical subjects, the rules have been made definite, and the whole carefully indexed. The subject matter has been arranged in two distinct parts: technical and general. Stress is laid, in the preparation of manuscripts, upon brevity, accuracy and clearness, and adherence to the accepted forms of present day usage. One of the greatest values of the book is the inclusion of certain material difficult to find elsewhere, at least in so convenient and compact a form. Among this material are useful lists, such as those of words still italicized and of words no longer italicized, English plurals of Latin or foreign terms, words still retaining foreign plurals, adjectives with variant endings, similar words frequently confused and so misused, etc. A chapter on very useful don'ts begins "Don't always go back to the Garden of Eden and review the literature to date." The sections on punctuation, case histories, abstracts, references and revision are very suggestive. Form of manuscript, proofreading, quoted material, indexing and the copyright are discussed. A very full alphabetical list of medical journals, English and foreign, with the standard abbreviations for their titles, completes the volume.

CLINICAL METHOD.

The Clinical Method in the Study of Disease. By R. M. WILSON, M. B., CH. B. With a Biographical Note on the Life of Dr. Horace Dobell. New York: Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1922. Pp. xii-57.

This little brochure contains an appreciation of Dobell's life and work. The influence of the Dobell is clearly shown. It is a refreshing bit of writing and should serve as a stimulus to the general practitioner.

THE POSTMARITAL SLUMP.

One. By SARAH WARDER MACCONNELL. New York: The Macmillan Company, 1922. Pp. 280.

"W . . . 'What is the matter with life for us? We have everything and it doesn't work.' . . ."

The couple in the story give their version of the marriage comedy; they have tried sincerely to make an adjustment. And this is their outcry, identical with the rest of the world. What is the matter?

The doctor and the lawyer probably hear this story most frequently. Intelligent people marry, the man is a philanderer, the woman a "fine woman." In spite of warnings, Alethea tries to make a go of their marriage. They are ideally mated, yet very near a crash. There are many things the matter, all of them within the domain of the psychoanalyst, scornfully bracketed with the medium. The man is charmingly maddening. He never lifts a finger in the adjustment, but lets his wife do all the soul searching while he supplies her with material in the shape of constant affairs, explained as a seeking for her. She is gravely at fault in submerging her personality into a composite of the ladies Frederick fancies. She is more concerned with seeming than being. Their course over the glittering surface of social life with its false ideals, principles, and aims is accurately pictured. Their goals are artificial, there is no humanness in them. They are the perfect phantasied types that suffer, and live poignant experiences—on paper. The sad part of it is that most people try to model their lives according to just such phantasies. They flee the reality within themselves, to posture according to distorted fashion.

The postmarital slump with which this book concerns itself primarily is a condition met with in and out of matrimony, when the individual has lost sight of his goal, when he lacks something definitely creative to do. The mistaken idea that the wealthy woman is blessedly freed from working, either with her mind or physically, is unconsciously pilloried in these pages. To be content one has to do. Otherwise ingrowing boredom is our lot.

FOUNDATIONS OF PERSONALITY.

The Foundations of Personality. By ABRAHAM MYERSON, M. D. Boston: Little, Brown & Co., 1921. Pp. 406.

Myerson presents a dogmatic, tiresome book which would be misleading to the layman and is useless to the physician. Little regard is made for accuracy of statement and all in all the book should be classed with that mass of semiscientific, popularized, narcotized rubbish written for purposes of sale rather than scientific worth.

PROSTITUTION.

Prostitution in the United States. Volume I: Prior to the Entrance of the United States Into the World War. By HOWARD B. WOOLSTON, Ph.D. New York: The Century Company, 1921. Pp. xiii-351.

Kimono. By JOHN PARIS. New York: Boni & Liveright, 1922. Pp. viii-320.

Woolston has endeavored to give a clear picture of prostitution in the United States. It is a good statistical study but as far as any remedial measures go his suggestions are not new and so far have proved of little value. He may argue that they are the best we have but this does not bring us nearer a solution.

* * *

While the study of an Anglo-Japanese alliance may be somewhat exotic for American tastes, *Kimono* contains information, local color, and interest rather out of the ordinary. It has the makings of a sociological report, yet remains a novel; it verges narrowly on the pictorial travel description, and still remains a novel. It is packed with information more truthful perhaps than pleasant in regard to vice conditions in Japan, and in this one feature does not comply with fiction legislation. Altogether, a young writer's intense feelings and beliefs on an important subject presented in enjoyable and lasting form.

Medicoliterary Notes.

Among those who are suffering the most extreme hardships in Russia, reports the American Relief Administration, are members of the medical profession. A doctor in almost complete destitution was given a food package, with the usual instructions that he must not sell it. The next morning he sent in word that it had turned so cold in the night that he could not go out without shoes, and he asked permission to sell some of the food to buy shoes. Needless to say, permission was granted. At Samara the wife of one of Europe's most noted specialists, Dr. Bode, the diagnostician, was discovered living in two little rooms with five other persons. She was starving. The daughter of Mendelieff, discoverer of the law for arriving at atomic weights of the basic elements, copies of whose charts hang in every chemistry class room in the world, was also found on the verge of starvation. Both women had formerly been very wealthy.

* * *

In the *International Labor Review* for April, 1922, is an article by Elizabeth D. Newcomb entitled Industrial Welfare Work in Great Britain. The writer states that the conceptions of what constitutes welfare work are very different in Great Britain and the United States. In Great Britain the welfare workers' duties cover most of those duties which in this country are considered to belong to employment managers. The same number of the *Review* contains full quotations from the recent report made to the Secretary of Labor on European emigration conditions as affecting the United States, by the late Lillian Russell Moore. She believed that we should declare an "immigration holiday" of five years. "If we don't keep up the bars," she says, "and make them higher and stronger, there will no longer be an America for Americans."

* * *

The National Tuberculosis Association has for rent or purchase a new motion picture, "The Kid Comes Through," produced especially for the New York Tuberculosis Association. The picture teaches general health habits rather than definite antituberculosis propaganda, and is intended to reach the child of the city slums.

* * *

On the city's last Health Day, the vision of one million school children was tested, and, according to Dr. I. H. Goldberger, director of the Bureau of Hygiene of the New York City Board of Education, defective vision was found in fully twenty-five per cent. of these children. Of one hundred thousand public school children who failed in their examinations last year, fifty thousand were found to have eye defects needing attention.

* * *

The New York Times Book Review in a recent number contains an item of interest to all who enjoyed Sheila Kaye-Smith's noteworthy novel, *Joanna Godden.* The item is quoted: A friend of W. L. George tells how Sheila Kaye-Smith came to write *Joanna Godden:* "My curiosity as to why Sheila Kaye-Smith dedicated her fine novel, *Joanna Godden,* to W. L. George has been satisfied by no less a person than Mr. George himself. It appears that Miss Kaye-Smith and he were out walking one afternoon in the Sussex lanes when they came upon a gaudy farm wagon with stripes of gold. On the side in large gold letters was the name of a woman farmer. Mr. George pointed at it with his cane. 'There's your next novel. The progressive woman against a background of the most pudding headed reactionaries in England!' Miss Kaye-Smith caught fire, and leaving the wagon behind, the two novelists went at it hammer and tongs, suggesting, discussing, arguing and ramifying the theme from which emerged at last *Joanna.*"

* * *

A notable papyrus, dating from at least three thousand years ago, has been presented to the New York Historical Society by a daughter of the late Edwin Smith. The document gives detailed descriptions of the setting of fractures, cranial trephining, draining of abscesses, and other surgical procedures. Dr. J. H. Breasted, the well known Egyptologist, is translating the manuscript.

* * *

Commissioner Burdette G. Lewis has in the *American Review of Reviews* for August an article entitled Choosing a State Official by Mental Test. He gives examples from New Jersey, and shows the economic as well as the psychological results of such a system.

* * *

The Board of Education of New York City and the Safety Institute of America have agreed to cooperate in publishing a *Safety Bulletin,* which will be circulated to school teachers with a view to instructing them to safety methods so that they in turn may incorporate safety training in their teaching of the fundamental subjects. The Safety Institute has just completed a survey of safety training in schools throughout the United States, covering more than a hundred cities. These data will form the basis of the safety teaching in the schools in this city.

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New Publications Received.

ANATOMIE COMPARATIVE. By J. Chaine. Paris: Librairie J. B. Bailliere et Fils, 1922. Pp. vii-276.

LA LITHIASE BILIAIRE. Par A. Chauffard. Deuxieme Edition. Paris: Masson et Cie, 1922. Pp. 247.

CREATIVE UNITY. By Rabindranath Tagore. New York: The MacMillan Company, 1922. Pp. vi-195.

L'AVENIR DE LA MEDECINE. Par Sir James Mackenzie. Traduit par le Dr. Francon. Paris: Masson et Cie, 1922. Pp. viii-272.

THE CLINICAL EXAMINATION OF THE NERVOUS SYSTEM. By G. H. Monrad-Krohn. With a Foreword by T. Grainger Stewart. New York: Paul B. Hoeber, 1922. Pp. xv-135.

THE PHYSIOLOGY OF GOUT, RHEUMATISM, AND ARTHRITIS, AS A GUIDE TO ACCURATE DIAGNOSIS AND EFFICIENT TREATMENT. By Percy Wilde, M. D. New York: William Wood & Co., 1922. Pp. 229.

PATHOLOGISCHE-ANATOMISCHE SITUSBILDER DER BAUCHHOHLE. Von Dr. Siegfried Oberndorfer. Mit 92 Tafeln in Kupfertifdruck und 92 Abbildungen im erklarenden Text. Munchen: J. F. Lehmann's Verlag, 1922. Pp. 133.

Practical Therapeutics

INTESTINAL SPASM IN INFANCY.*

By S. Seilikovitch, M. D.,
Philadelphia,
Pediatrist to the Mount Sinai Hospital.

Intestinal spasm, abdominal colic, intestinal cramp, or simple colic, is a common condition.

These paroxysms occur, as a rule, in the first three months of life at irregular intervals. They may begin when the child is three months old and continue for about two months. With some the colicky periods occur during the day, with others during the night.

What is the etiology of this condition? It is a compression of the nerve filaments distributed between the various muscular coats, mainly of the small intestine. The contractions are due to an irregular peristalsis, produced by gases which distend the intestines, or other mechanical irritations, as improper food, or overfeeding, also to the retention of meconium. Many children are made dangerously ill through the mother's kindness. The cry of the infant means hunger to the mother, so she responds by feeding the child. This overtaxes the delicate stomach, giving it no rest. The amount of food introduced into the economy is much more than can be digested and assimilated.

Nature endeavors to right the wrong done to the child, making it regurgitate the excess food, or eliminate it through the bowels, thus causing increased peristalsis, hence the spasm. This is especially true in artificially fed children, not only when the child is fed at irregular, short intervals, but when the quantity at each feeding is too great for the age of the child, even with the proper length of intervals between feedings observed.

There is one more element, improper preparation of food. The infant's food is milk and even breast milk may be at fault and disagree with the child's digestion. Milk of an unwholesome character may be found in artificial food. Fresh, normal milk may not be properly prepared to suit the digestive power of the infant. In infants of ten months and over, diarrhea, vomiting or colic may occur not directly from the milk but from other food. Many articles of food or drugs taken by the nursing mother will act upon her milk, and may cause diarrhea, vomiting and colic in the infant. Laxatives, purgatives, sour fruits, and other foods may cause the same condition.

The mental state of the mother will act upon the milk causing colic, and it may even kill the child, as the condition of the mind reacts upon the body, its functions, secretions and excretions, and the milk of the mother may become toxic when her mind is in a state of worry or fear. Remember to instruct the mother never to nurse her infant during or shortly after a fit of anger, or anxiety, as grave accidents to the infant have been known to follow. A few cases on record and an incident in my private practice will illustrate:

A mother of a five months breastfed baby suspected her young husband of marital infidelity; her suspicion grew when he absented himself for a week from home under the guise of business. She did not disclose the cause of her nervousness even to her physician, who happened to be myself. The strain weighed heavily upon her mind. The baby suffered from colic, which I attributed to the change in the milk. I advised her to go to the country. I was called on the third day and found her condition worse. She then disclosed her suspicion, giving it as a cause of her nervous state. She returned to the city, surprised her husband, finding him with the woman she suspected. A short time after the scene, she nursed her child. The child soon returned the breast milk and in a few minutes began to scream, drawing up its legs over the abdomen, and expired in a convulsive movement. I have observed many similar cases resulting in cramps, vomiting or convulsions, though not ending so tragically.

The most common cause of intestinal spasms in infancy is the accumulation of gases, which are expelled alone or with the feces, without causing disturbance. When they develop in undue quantity or are retained too long as in slow digestion, constipation or other causes, they excite this exaggerated peristalsis.

Bottle fed children are often left with an empty bottle or with a rubber nipple in the mouth. This may give rise to cramps. The same condition may take place when the mother's breasts are empty and the infant continues to suckle.

An attack may come from the child walking or standing barefoot or creeping on a cold or damp floor, or when the abdomen is exposed to cold by throwing off the covering at night, lying too long in a wet diaper, or when cold drinks are given. Recently I was called to see a child, thirteen months old, suffering with a severe attack of cramps, followed by convulsions, caused by an iceball given by the mother.

Nothing makes the physician so proficient as keen observation, especially in diseases of children. The position and movements of body and each muscle of the face have their meanings, their significance. The pediatrist has to interpret the child's language when no history is obtainable from the child or from the mother.

Intestinal spasms may be mild or severe. The mild cases do not attract much attention, being of short duration at long intervals. The child being asleep may become restless. There is a slight scream, a few kicks, eructation of gas or a discharge of flatus through the anus, and the child quietly sleeps again. The mother thinks the child is dreaming. In the severe and very severe cases the symptoms differ in degree and duration. The child, whether asleep or awake, suddenly becomes restless, the face assumes an anxious expression, a few short cries are emitted, it twists its body, flexes the legs upon the thigh and abdomen, extends them, fixes them again with rapid movements. As the pain increases, the cries become piercing, until relaxation takes place after flatus or gases are discharged and the baby quiets down. Examining the child at this moment you find nothing wrong with it, no sensitive parts of the anatomy, the kicking is playful, the face is bright. In a few minutes the smiling face of the baby becomes drawn, piercing, pitiful cries replace the cooing, vigorous kicking continues until the abdomen becomes soft again, when the paroxysm is over, and a smile reappears as though nothing had happened. This may be repeated at short intervals.

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*Read before the Southeast Branch of the Philadelphia County Medical Society, May 4, 1922.

The field for a differential diagnosis is not as complex as in adults, as we may exclude lead colic, renal colic, billiary colic, intestinal obstruction, intestinal inflammation, appendicitis, reflexes from ovarian or uterine diseases, intussusception, and other conditions.

A case of intestinal spasm cannot be mistaken for any other intestinal or peritoneal condition if we bear in mind the symptoms. The sudden onset, restlessness, anxious face, flexion and extension of the legs, intermittent screams, eructations, relaxation and again a smile, as though nothing had happened, all this does not take place in any other pathological condition, even when some fever is present, which may occur in the presence of indigestible milk curds or constipation.

If simple intestinal spasms are concomitant with a grave intestinal disease, there is always a rise in temperature, symptoms peculiar to the disease will throw light upon the condition. The extension and flexion of the legs upon the abdomen are instinctively performed by the child, as pressure on the abdomen relieves the pain somewhat. Many a time I have relieved pain temporarily by pressing my hand over the abdomen. In grave intestinal conditions pressure over the abdomen and forcible movements of the legs increase the pain.

In intussusception, certain symptoms may simulate simple colic, but other symptoms show that another condition is present. Abdominal pain may occur suddenly, the child drawing up its legs in agony; vomiting and pain may occur at irregular intervals. The pain may suddenly cease but the vomiting may be of a liquid fecal character. There may be a discharge of bloody mucus from the rectum, and with the sudden cessation of pain, which may mean the occurrence of gangrene, the child's appearance will be different from that when there is a cessation of pain in colica spasmodica, when the face brightens up.

The cry alone, rising at times to screams, does not mean colic as the child may be underfed or hungry. In this condition it will be pacified when put to the breast or given the bottle, but not so in a colic cry when the child will not be quieted until the spasm is over. The nursing may aggravate the condition.

The cry in colic is different from the cries from other causes. It is impossible to describe the different cries. There is a hunger cry, temper cry, pain cry, thirst cry, discomfort cry, colic cry, all different as to the tone, force, pitch, tempo, intervals, with different variations and motions. The observation of these different cries will help us interpret them. I have pointed out these cries in the children's ward to the nurses and interns.

To treat a condition of this kind by prescribing an opiate, is worse than to treat a cough with morphine or a diarrhea with astringents, and more dangerous than not to treat it at all.

For immediate relief it is best to wash out the lower bowel with tepid bicarbonate of soda or asafetida water; place a hot spice poultice to the abdomen and put the child with its abdomen over the lap. I successfully made use of certain antispasmodic and carminative drugs. As a prophylactic it is necessary to go into the history of the quality and quantity of food and intervals of feeding, taking into consideration the age of the child. We should inquire about the mother's diet and condition of her alimentary tract and mental state. It is advisable to instruct the mother to put her colicky baby with the head over her shoulders, after nursing and patting it for a few seconds on its back. She should never give any soothing syrups, as many infants fall asleep to the satisfaction of the mother and the benefit of the undertaker. It is necessary to study the case, to find out the cause or causes mentioned and to remove them by giving the right directions.

935 South Third Street.

Constricting Duodenal Stenosis of Tuberculous Origin.—Artur Loew (*Wiener Archiv für Innere Medizin,* April 5, 1922) reports a case of infrapapillary tuberculous stenosis for the first time in the literature. The patient was a female, thirty-nine years old, with tuberculous involvement of one lung apex. There was pain on walking and on pressure and vomiting, especially after taking fluids, one to three times daily. The epigastrium was moderately tender and the mesogastrium revealed a nodular insensitive tumor moving slightly with respiration and easily displaceable downward and laterally, as large as a small fist. The stomach contents showed signs of obstruction. Röntgenographically, the duodenum showed a permanent filling about up to the transition of the descending into the horizontal part and considerable dilatation of the whole duodenum up to this point; the fluoroscope showed no emptying of the duodenum; stomach and duodenum showed no emptying after twenty-four hours.

The first operation (posterior retrocolic gastroenterostomy) revealed a retroperitoneal mass as large as a man's fist at the duodenojejunal fold, numerous masses varying in size from a hazelnut to an apple and the superior horizontal part and descending part of the duodenum were markedly dilated. A second operation (anterior antecolic gastroenterostomy) was followed after two weeks by death.

The necropsy revealed a constricting tuberculous ulcer of the lower duodenum and the beginning of the jejunum; near the papilla of Vater, a reticular system of cicatricial ulcers in the process of healing with polyp formation; occasional caseated tubercles; the intestinal lumen at the transition of the duodenum into the jejunum did not admit even the small finger, the walls were inelastic and above this area the duodenum was dilated; large masses of old tuberculous lymph nodes at the root of the mesentery with encapsulated caseous foci; a single tuberculous ulcer in the ileum and no other tuberculous lesions elsewhere in the body.

Proceedings of Societies

AMERICAN PEDIATRIC SOCIETY.

Thirty-fourth Annual Meeting, Held in Washington, D. C., May 1, 2 and 3, 1922.

The President, Dr. Maynard Ladd, of Boston, in the Chair.

(Continued from page 180)

Three Cases of Acute Encephalitis Treated with Specific Serum.—Dr. Henry F. Helmholz and Dr. Edward C. Rosenow, of Rochester, Minn., related the detailed history of three cases of undoubted acute encephalitis which were treated with Rosenow's antiencephalitic serum. In all three cases the effect of the injection of this serum was so striking that it seemed advisable to report even so small a group as this, hoping in this way to interest others in the specific treatment of encephalitis, in order to determine whether in a larger series of cases the same excellent results were obtainable. The experience of any one man with acute encephalitis was rather limited, but the number of cases was large in the aggregate, so they were anxious that the serum be tested out in a large number of cases. It was available to all who were interested in using it. They did not assert at present that the specific serum was the curative factor in these cases; all they could say was that with the injection of the serum there was a decided improvement in the general condition of the patients and a complete clearing up of the nervous symptoms of encephalitis. Furthermore, from animal experiments which were described, it had been shown that the serum could protect animals from intracerebral injections of the streptococcus, which was not the case with normal horse serum.

Dr. Rood Taylor, of Minneapolis, stated that his experience with the use of the specific serum in the treatment of epidemic encephalitis was limited to one case. In this instance the patient did not live. He felt convinced of the beneficial effects of the serum in poliomyelitis and was favorably inclined toward the antiencephalitis serum.

Dr. Henry Heiman, of New York, thought that inasmuch as no treatment of encephalitis lethargica had yet been effective, any new treatment that held out promise was worthy of a trial.

Blood in Breast Milk.—Dr. Isaac A. Abt, of Chicago, reported the case of a male child, who, aside from being underweight, was otherwise normal. When three days old it was noticed that his stools were black and tarry and at the same time the mother's milk from both breasts was a peculiar chocolate color. The chocolate colored milk continued for several days. The mother was otherwise in perfect health. Bacteriological examination of the secretion showed it to contain Staphylococcus albus. The baby was withdrawn from the breast and the breast dried up.

In searching the literature it was found that this condition might occur as a result of a variety of conditions, among which might be mentioned inflammatory processes, wounds and ulcers, though hemorrhages might occur from both breasts spontaneously without external cause. Neoplasm might produce hemorrhage and it had been variously considered by some that they were benign and by others that they were malignant. The condition might occur in young women suffering from chlorosis or amenorrhea, also in the climateric. Again bloody milk might occur without any explanation of the etiology. Cases had been reported in which intracanalicular papilloma, myoma and myxoma of the breast had been described as etiological factors. In some instances chronic mastitis had been known to produce a blody discharge from the breast. Red milk might be produced by the reaction of certain bacteria. Bloody milk occurred in cattle more often than was supposed. Indeed, small amounts of blood were very common. It might also be produced by trauma or marked hyperemia of the udder after parturition and it might also be due to catarrhal mammitis or a streptococcus mammitis.

The Rate of Secretion of Breast Milk.—Dr. Charles Hendee Smith and Katherine Merritt, of New York, described an investigation carried out with the object of finding out at what rate the baby obtained milk from the breast, as determined by weighings at short intervals during nursing, and also to determine the average time which it took for an infant to obtain the entire feeding. From the results it seemed fair to conclude that a normal baby fed on one breast took from forty to sixty per cent. of his total feeding in the first two minutes, and from sixty to eighty-five per cent. in the first four minutes. After eight to ten minutes very few babies got any milk whatever. This held true whether the supply was abundant, moderate or scanty. It might be fairly said that it was not desirable to let a baby nurse after he really stopped getting milk from the breast. The child who sucked would swallow and if he obtained no milk he would swallow air, which predisposed to vomiting and colic. Prolonged nursing also fostered the habit of chewing the nipple when no milk was being secreted. Again the saving of the mother's time and the sparing of her nervous system had to be considered. It was further shown that the babies who needed both breasts usually got less from the second than from the first side. The rate at which the baby got milk from the second breast was similar to that of the first breast, though the time after which the baby got more milk from the second breast was usually shorter than from the first. The poor feedings had been completed in a relatively shorter time than the good ones. When the breast supply was evidently failing the baby obtained all he could get in from three to five minutes, as a rule. It did no good to leave a baby a longer time (fifteen to twenty minutes) at a failing breast in the hope of ekeing out a meagre supply.

If a baby emptied the breast in from five to eight minutes and showed no signs of discomfort from an adequate feeding obtained in that time, there seemed no good reason why he should not take his bottle in the same time. Eight to ten minutes should be ample time for any but the feeblest infants to take a bottle, provided the nipple holes were of good size so that the milk flowed freely.

Relation of Basal Metabolism to Caloric Intake and Weight Curve.—Dr. Fritz B. Talbot, Dr. Warren Sisson, Margaret E. Moriarty, and Alice J. Dalrymple based this communication on a study of the basal metabolism of seven of twenty-two premature babies studied by them during the past year and a half in its relation to the caloric intake and the weight curve. The babies, though organically sound, were prematurely born from one to two months, had a high pulse rate, an unstable temperature and were too weak to nurse at the breast at first. This necessitated feeding them with the Breck feeder or a tube; the usual precautions taken with the newborn were carried out. The technic previously described by Benedict and Talbot was employed, with some modifications. The results were graphically shown in charts and exhibited a surprising conformity. These charts showed that the caloric intake to the kilogram of weight was high, which was in keeping with the findings of previous investigators. The basal metabolism, on the other hand, was strikingly low. This low metabolism seemed to be dependent upon the fact that there was a small amount of active heat forming tissue in these incompletely developed infants. This evidence was contrary to the generally accepted belief that small subjects with relatively large body surface produce a more uniform amount of heat to the unit of body surface than do larger subjects. Premature infants were so protected with blankets and hot water bottles that an extensive loss of heat was prevented. Dr. Talbot believed they were unable to compensate for such a loss of heat, as evidenced by the subnormal temperature when the infants were deprived of external warmth. It was further shown that the infants did not gain weight until they were able to digest close to two hundred calories in the day. The only food which was assimilated completely enough to accomplish this was human milk. The fact was also brought out that a relatively large proportion of the food intake went into new body tissue. The large excess of the caloric intake over the basal was necessary because of the relatively greater amount of growth essential for the normal development of these babies.

Dr. Walter Lester Carr, of New York, asserted that this scientific investigation brought out facts that they had found to be true clinically at the Manhattan Maternity Hospital last year. These premature babies at first did not do well on mother's milk. Such babies might be helped by alternate feeding of sterile water. Dr. Talbot's observations with reference to the metabolism confirmed their clinical observations that it was best to avoid moving these premature infants. In order to avoid moving the babies they had used an arrangement whereby the baby's head was outside of the incubator. This made it possible to feed the baby without disturbing him. They had found that the babies should be kept in the incubator until they weighed five pounds. When they reached a weight of four pounds they were taken out for a half hour and put back and this practice was continued until they reached a weight of five pounds when they were sent home.

Dr. Julius Hess, of Chicago, said it was their experience that nearly all these premature infants could take a good grade of older breast milk, that is, breast milk from mothers four to six weeks postpartum. The important thing was to give sufficient fluids. They had found it almost impossible to give anything like the caloric needs during the first week or so, but unless one seventh to one eighth the body weight was given in total fluids the babies did not do well. The amount of fluid ingested made a surprising difference in the quantity of breast milk these babies could metabolize and a surprising difference in the results.

Dr. Talbot, in closing, again emphasized that these premature infants must be given a much larger number of calories than they would seem to need until they got a little leeway. One could not expect a baby to do well until he could take and utilize from 150 to 200 calories in the day.

Celiac Disease.—Dr. Rood Taylor, of Minneapolis, Minn., stated that celiac disease was one kind of intestinal indigestion which had been variously named, the most commonly used titles being Herter's infantilism, intestinal infantilism and pancreatic insufficiency. A detailed study of seven cases was included in this paper, in six of which the disease was preceded by a long period of malfeeding, and in four by a definite parenteral infection. In five cases in which the gastric contents were examined gastric achlorhydria was present. The duodenal juice was examined in three cases, and a pathological pigment, urobiligen, was found in one case. This furnished evidence of diffuse pathology in the liver. In a second case there was a complicating Banti's disease; in a third case leucin and tyrosin were present in the urine, and in all the cases the liver was smaller than normal. These findings the writer stated were evidence of the involvement of the liver. The duodenal juice in all cases contained bile salts and starch and also protein splitting ferments. Examination of the stools in four cases showed fairly good fat splitting. Data were included which presented evidence of the considerable therapeutic efficacy of lactic acid milk and dextrose in the treatment of this disease.

Dr. McKim Marriott, of St. Louis, confirmed Dr. Taylor's statements and invited attention to a type of diet not unlike that which Dr. Taylor had used, a diet consisting of protein, and prepared by taking the curds of three quarts of milk and grinding them up to make one quart. To prevent edema they supplied codliver oil and vitamine. Additional protein was added in the form of scraped beef. A sufficient amount of carbohydrate was added in the form of corn syrup, one to three ounces. When there was organisms in the gastrointestinal tract they added argyrol to make a concentration of 1-300, and they had also resorted to transfusion with benefit. To meet the indications of achlorhydria they added hydrochloric acid, but not in the amounts ordinarily used; twenty-five c. c. of normal hydrochloric acid was the amount they had found necessary to bring the stomach contents to normal. If acidosis developed in these children this had to be eliminated.

Dr. John Lovett Morse, of Boston, Mass., considered it unfortunate to adopt the name celiac disease as though this was a special disease, which he did not believe it was. The condition might be due to intolerance to fat, to intolerance to starches or intolerance to sugar; almost never intolerance to protein. These cases could be treated more intelligently if they were regarded as indigestion of some particular type rather than as one thing. The condition was a symptoms complex and not a disease. The curds and corn syrup were especially useful in certain of these cases; the lactic acid milk he did not think amounted to a great deal. High protein counted for a great deal and scraped beef added a great deal. Good nursing did a great deal of good, medicine very little.

Dr. HENRY KOPLIK, of New York, agreed with Dr. Morse that each of these cases had to be judged on its own merits. One had to analyze everything that went into the body and everything that came out and find for what substance the baby had an intolerance.

Dr. ISAAC A. ABT, of Chicago, believed that celiac disease was a distinct entity. The vast majority of these children would do well under any kind of treatment for a time, a number of weeks or months, and then a catastrophe occurred of greater or less severity. Then after a rest they recovered and went ahead for a while. Every kind of treatment was merely temporizing; when the children grew older they overcame the trouble. Peterson, in the *American Journal of the Medical Sciences,* advocated a mild form of x ray treatment for the purpose of stimulating the pancreatic cells. Whether or not there was anything in that form of treatment, Dr. Abt said he was not prepared to say.

Dr. ROWLAND GODFREY FREEMAN, of New York, cited a case of this type in which the administration of pancreatic extract appeared to be more effective than anything else. As soon as the pancreatic extract was stopped the child did not do so well.

Dr. L. EMMETT HOLT, of New York, stated that the thing which interested him most in regard to these cases was the prolonged effect on growth. At a certain age these children became able to digest their food, and if the condition had not continued too long they made up their growth; in other cases in which the condition had persisted too long the children were permanently affected as to their growth and development. An important factor was the control of the child and the establishment of regular discipline in the home. Unless this could be done it was absolutely impossible to attain satisfactory results. Few of the speaker's cases had been of fat intolerance; the greater proportion of the patients had suffered from carbohydrate intolerance. The large use of starchy foods was becoming a little too popular; there was a tendency to give an excess of starchy foods in the latter part of the first year and in the second year. Most of the mistakes were made by excluding fats; these children did take fats if the fats were given with the carbohydrate and were not excessive. These children should not be fed oftener than three times a day. It was also important to give large amounts of water, by clysis if it could not be given otherwise. Many of these cases were mistakenly diagnosed as tuberculous peritonitis and treated for that condition, not so much by pediatrists as by the general practitioner.

Experimental Studies with Proprietary Vitamine Products.—Dr. JULIUS HESS, Dr. JOSIAH H. MOORE, and Dr. JOSEPH K. CALVIN, of Chicago, presented the results of their investigation of certain of the socalled concentrated vitamine products on the market to ascertain, if possible, whether the claims made for them were well founded. The object of the first study was to test the potency of metagen in regard to its antiscorbutic vitamine. One group of animals was fed on oats, hay and water. These developed scurvy on an average of two or three weeks after commencing the diet and unless the diet was altered died between one and three weeks after scurvy was diagnosed. In a second group, receiving oats, hay and milk, scurvy developed in from two to five weeks and the animals died in from three to six weeks unless orange juice was given. A third group, receiving oats, hay and water, plus twenty grains of metagen; in every instance scurvy developed in from two to four weeks and they died of scurvy a few weeks later if unprotected by orange juice. Thus experiments showed that metagen as obtained in the open market contained no demonstrable amount of antiscorbutic substance as shown by experiments on guineapigs. A second product studied in like manner was that commercially known as vitamon. In the animals fed on a scurvy producing diet plus the vitamon, without exception scurvy developed in from fourteen to sixteen days. A third product now in the process of experimental preparation, which contains dried orange juice and desiccated pig's liver, was investigated at the manufacturer's request. In all of the animals on larger doses of this product diarrhea developed, they lost weight and finally died. They had gained the impression that this was due to a toxic effect of the preparation. These three products were found to contain insufficient antiscorbutic vitamine to protect guineapigs from scurvy when administered in quantities recommended as protecting doses for infants and children.

Studies on the antineuritic vitamine or water soluble B were carried out. In all the pigeons fed on a diet of polished rice and water, experimental polyneuritis developed in three or four weeks on an average. Those fed upon the same diet but receiving one gram (one twelfth of a cake) of fresh commercial yeast daily remained free from the disease at the end of three months. A pigeon fed on metagen as prophylactic treatment remained free from signs of polyneuritis for a period of ten weeks, after which time the disease developed. It appeared from these experiments that the process of manufacture and subsequent ageing of the concentrated vitamine products had not caused as much deterioration of the antineuritic vitamine products as of the antiscorbutic properties. While all these substances contained water soluble B they had a lower potency than fresh yeast, with the possible exception of the yeast vitamine-Harris preparation. The claims that one or all of the known vitamines could be prepared for dispensing in a concentrated form which would not be affected by drying, aging and oxidation were, in the light of this experimental work, open to great question. Vitamines should be obtained from the dairy, the grocery and the market, instead of the drug store.

Indications for Tonsillectomy in Infancy and Childhood.—Dr. Henry Heiman, of New York, asserted that during the past few years there had been engendered in the minds of medical men an unbounded spirit of antagonism toward the faucial tonsils. Last year medical school inspectors in New York city recommended tonsil treatment for 49,250 children. If the problem were extended to the whole country it would undoubtedly include more than a million children. The fact should be emphasized that tonsillectomy was quite a major operation. Its risks were very definite. Numerous serious complications had been reported and a large number had not been reported. The indiscriminate removal of the tonsils should be condemned. After outlining briefly the history of tonsillectomy, discussing the functions of the tonsils, and presenting an analysis of two hundred cases observed in private practice in which the tonsils had been previously removed for a variety of reasons, Dr. Heiman formulated rational indications for tonsillectomy.

He stated that in his group of cases he had seen the development of a definite lung abscess, an acute otitis media, followed by mastoiditis and three severe cases of pharyngitis after tonsillectomy. During the past three years there were admitted to the Pediatric Service of Mt. Sinai Hospital seven cases of lung abscess, seven cases of bronchopneumonia and one case of lobar pneumonia which had developed after removal of the tonsils. In selecting their cases for removal of the tonsils and adenoids we should be guarded by safe and conservative principles: 1. If obstructive symptoms (mouth breathing and snoring at night) were present with evidence of high arched palate as the cause of obstruction the adenoids should be removed. 2. If there was a persistent nasal discharge that did not yield to the usual therapeutic measures and in the absence of a sinusitis, the adenoidectomy should be performed. 3. If the tonsils were sufficiently large to cause obstruction, difficulty in breathing or swallowing, tonsillectomy was indicated. One must not be misled, however, by the presence of a large tonsil that appeared to be obstructive, a tonsil that was rather pushed out toward the median line by the presence of a deep cervical adenitis. The writer had described these cases of parapharyngeal adenitis, which occurred most commonly after grippe, scarlet fever and measles. 4. If the frequent occurrence of tonsillitis had produced definite disease in the tonsils, as evidenced by irregularity, raggedness, and friability, tonsillectomy was indicated. 5. If there were recurrent accumulations of cheesy material in the crypts of the tonsils, or if on pressure this might be extruded from the tonsils, with the presence of a foul odor of the patient's breath and symptoms of toxic absorption, the tonsils should be removed. 6. In cases of persistent cervical adenitis following tonsillitis, whether of pyogenic or tuberculous origin, tonsillectomy was indicated. These were general rules, but each case must be studied individually, and the advantages and risks considered before operation. Tonsillitis was usually but a manifestation of systemic infection. If the infection became generalized, it occurred in spite of the tonsil, not because of it.

(*To be concluded.*)

Letters to the Editor.

PHYSIOLOGICAL ADJUVANT IN REST CURE OF TUBERCULOSIS.

New York, *July 26, 1922.*

To the Editor:

Since you honored me by the publication of my article on the Physiological Adjuvant in the Rest Cure of Pulmonary Tuberculosis in your July 19th issue, I have received a number of letters asking me for more detailed information on how to teach the tuberculous patient the diaphragmatic breathing. I would, therefore, be indebted to you for the publication of the following item:

To be sure that the patient understands exactly what is meant by diaphragmatic breathing, it is well to teach it in the following manner: Place the patient in a sitting or half reclining position, with his feet extended and slightly separated. Then tell him to inhale as slowly as the physician's hand with index finger pointing moves upward along the limb, beginning at the toes on the right foot, crosses the abdomen to the left, and then stops a second to exhale while the hand moves slowly in the downward direction to the left foot. The physician or nurse teaching this breathing should repeat this procedure a few times until the patient fully grasps what he is asked to do and does it correctly. To this end it is well for the physician, while indicating the direction and duration of the inhalation with one hand, to place the other hand over the upper portion of the lungs and thus observe whether they are at complete or at least at relative rest. When the patient is lying in the complete recumbent position, with head slightly elevated, the diaphragmatic breathing will be materially aided by placing a very small pillow or a folded bath towel under the small of the back.

This diaphragmatic breathing not only gives rest to the lesions in the upper lobes but also causes a better circulation in the lower extremities and abdominal viscera especially aiding the hepatic function, all of which is so essential for patients who are ordered complete physical rest on a reclining chair or bed. As a rule, the patient of average intelligence will soon learn this method of breathing and will enjoy it because it gives him physical comfort and something to occupy his mind. In fact, this slow type of breathing is conducive to quiet and serenity; a psychic condition most desirable in the rest cure of tuberculosis but as a rule absent in majority of the patients.

In conclusion, may I draw your attention to a typographical error which occurred on page 67, sixth line, where the word "quality" instead of "quantity" appears? The sentence should read: "While this breathing from the toes upward and as far as the abdomen is of course merely imaginary, it results in a diaphragmatic breathing, and whatever quantity of air is inhaled passes mainly through the lower portions of the lungs, while the upper portion, where the tuberculous lesions are usually located, are put at comparative rest."

S. Adolphus Knopf, M.D.

Abstracts from Current Literature

GYNECOLOGY AND OBSTETRICS

A Case of Double Malformation of the Female Genitals with a Persistent Rectovesical Ligament and an Ovarian Tumor with Twisted Pedicle.—Heintz Küstner (*Zentralblatt für Gynäkologie,* May 6, 1922) reports a case of a nineteen year old girl who showed a prominence of the right side of the abdomen, a sagitally running, fairly fleshy septum dividing the vestibule of the vagina into half and also extending to the end of the vagina. Two cervices were also found lying alongside of each other. A tumor as large as a child's head, apparently springing from the right adnexa, almost filled the lower pelvis and partly the upper pelvis. The right edge of the tumor was particularly painful. At operation a bluish red, tense tumor, as large as a man's head was seen, over which a thickened tube was lying. The tumor sprang from the right ovary and the pedicle was twisted 360 degrees. There were two well developed uteri, one behind the other, separated by a fairly thick persistent rectovesical septum. The tumor twisted according to Küstner's law, twisting from behind forward and upward from the lower pelvis, because of lack of space for growth. The pelvis was not widened.

A Surface Papilloma of the Ovary.—Heinrich Heberer (*Zentralblatt für Gynäkologie,* May 6, 1922) reports a case in a woman forty-four years old who showed an increased size of the abdomen, marked cachexia, free ascites and a large tumor below the umbilicus. To the left of the uterus there was a movable, soft tumor larger than a child's head which seemed to arise from the left ovary. At operation a large amount of dark yellow fluid gushed forth and the tumor was found to consist of numerous, soft, papillary masses as large as a child's head, springing from the ovary. The upper part of the left broad ligament was infiltrated and the round ligament showed a grayish yellow necrotic area. The areas around the bladder were edematous. The ovarian tumor was adherent to the surroundings and the cul de sac of Douglas showed nodules suspicious of carcinoma. The section of the tumor made it possible to exclude carcinoma and it was found to be a pure ovarian papilloma. This was originally an intracystic growth (seen in this stage on the opposite ovary), which later became superficial. They are originally benign, but may later undergo carcinomatous degeneration. Their earliest possible extirpation together with the uterus and the healthy ovary is advised, as this condition is usually bilateral.

A New Case of Birth After Death.—F. Strassmann (*Wiener klinische Wochenschrift,* April 6, 1922) reports a case of the sudden death of a young pregnant woman. At necropsy, a well macerated fetus twenty-four cm. long was found between her thighs, with its head toward the woman's feet and its legs ten cm. from her pubis. The umbilical cord was tense and emerged from the woman's vagina. The woman's relatives and the morgue attendant denied the previous presence of a fetus and the body was not unduly shaken during transportation. The cause of death could not be definitely established because of decomposition, but it was an infectious disease, probably grippe and pneumonia, associated with marked gaseous distention. The peculiar feature of this case was the early stage of the pregnancy as compared with that of other cases reported, which were either at term or nearly so. These cases are usually classified as those with decomposition of the body, which causes the expulsion of the fetus, and those without decomposition, in which the expulsion is caused by afterpains or rigor mortis of the uterus. To a certain extent the case reported falls into the second group, namely, cases with and without inversion of the uterus. This case is also peculiar because the inversion of the uterus was absent, but the expulsion must still be attributed to the decomposition. As this occurred more than thirty-six hours after death, uterine rigor mortis and afterpains must be excluded. The pains beginning during life caused the dilatation of the cervix and the partial or complete expulsion of the fetus, aided probably by a few pains after death or rigor mortis. As the gas content of the intestines increased from the decomposition, the fetus was expelled from the vagina.

Relaxation of the Vaginal Outlet.—L. E. Burch (*Surgery, Gynecology and Obstetrics,* January, 1922) presents the cause and treatment of vaginal relaxation as follows: Relaxation of the vaginal outlet is caused by overstretching of the levator ani muscle and lack of tone following labor. It is impossible for the obstetrician to determine at labor whether the muscle will regain its normal function or not. All lacerations following labor should be immediately repaired for the purpose of preventing sepsis, remembering that it will not prevent relaxation if the levator is overstretched. The condition is easily cured at secondary operation by bringing together the overstretched muscle in the median line by interrupted sutures.

Retrodisplacements of the Uterus.—William T. Black (*Southern Medical Journal,* April, 1920) asserts that many needless operations for retrodisplacement are being performed. Congenital retrodisplacements rarely require treatment. Simple displacements, following recent pregnancies, can often be corrected by the wearing of a properly fitted pessary. The type of operation best suited to the various conditions encountered in retrodisplacements should be selected with judgment. It is an unpardonable mistake to use the same technic in all cases.

Treatment of Pregnancy in Heart Disease.—N. S. Heaney (*Surgery, Gynecology and Obstetrics,* February, 1922) asserts that physicians are not justified in refusing pregnancy to women with accidental or symptomless heart murmurs. Women who have had recent broken compensation, or broken compensation in a preceding pregnancy, enter pregnancy greatly jeopardized. Cæsarean section is not a ready and complete solution of the delivery of a woman with a broken compensation. Abortion for heart disease should have sterilization added to it when this can be accomplished with but little additional risk.

A Case of Myoma Uteri with Severe Ascites.—O. Dunkhase (*Zentralblatt für Gynäkologie,* May 6, 1922) reports a rare case in which a woman fifty-one years old, who noticed a swelling of the abdomen and legs for four weeks, showed a poor general condition, cachexia and dyspnea. The abdomen was enormously distended (measuring 133 cm. at the level of the umbilicus) and rigid. Free ascites was demonstrable but no tumor. About twelve litres of clear, yellow fluid were released by puncture and then a tumor as large as a child's head was demonstrable. The tumor was attached to the uterus and was adherent to the peritoneum. A supracervical amputation of the uterus was done. Section revealed the tumor to be a myoma, exceptionally rich in cells and little fibrous elements; its uniformity was not in favor of sarcoma. Recovery followed. The sudden development and great amount of ascites in this case is explainable only by the fact that the pedicled large tumor exerted traction on the peritoneum by its change in position and thereby caused the exceptionally large vessels spreading from the peritoneum to the tumor to become twisted, which was further aided by the pressure of the tumor on the congested pelvic vessels.

Sterility in the Female.—W. Lahm (*Zentralblatt für Gynäkologie,* April 22, 1922) introduces a new conception of the process of ovulation. As a result of his experiments he no longer considers it as depending upon a genital but otherwise independent process but as the result of a sympathetic reflex, which sets in when the arterial increase of pressure in the region of the follicle is markedly increased by a nervous impulse. The association of this factor with libido speaks in favor of this assumption and also shows the retroactive effect of the ovarian condition and of the endocrine hormones respectively upon the psychic preparedness for conception. If the above mentioned sympathetic reflex does not occur, or if it is unable to produce an increased pressure in the ovary as a result of continuous hyperemia, ovulation cannot occur and the follicle undergoes cystic degeneration; a protracted chronic ovarian congestion with an otherwise unchanged intensity of the sympathetic impulse must lead to the weakening or inhibition of follicular rupture. In this way the cycle of the ovarian condition, of the sympathetic tonus, of the internal secretion and of the chronic hyperemia of the genitals constitutes an entity. This also explains the reason for chronic congestion from dyspareunia and its association with chronic congestion, and also why dyspareunia results from coitus interruptus and why it can produce easily demonstrable injuries of the ovary and uterus with the various sequelae, including female sterility.

Tubal Torsion with Hematoma Formation and Its Etiology—A. Hansen (*Zentralblatt für Gynäkologie,* May 6, 1922) reports a case in a girl fourteen years old, who had not menstruated and showed severe pains on the right side of the abdomen, abdominal distention, vomiting and constipation. The right side of the abdomen was markedly rigid and tender below McBurney's point. A rectal examination showed tenderness of the right adnexa. A diagnosis of appendicitis was made and operation revealed the presence of a smooth, blackish blue, tensely elastic tumor at the lower angle of the wound. The appendix was normal. The tumor consisted of the dilated ampullar part of the tube twisted on the isthmial portion through 360 degrees, which was not adherent. The tube was easily extirpated. There was a distinct constriction at the site of torsion. The torsion of the tube was the result of kinking and a difference in pressure in the vascular system: the elastic, thin-walled veins became compromised, whereas the rigid arteries allowed more blood to pass; the veins were markedly filled and distended, which then surrounded the rigidly fixed arteries like a spiral. These cases must be carefully differentiated from appendicitis.

HEART AND BLOODVESSELS

Blood Pressure in Cerebral Decompression.—J Y. Malone (*Annals of Surgery,* June, 1922) from an experimental and clinical study concludes that: Medullary compensation* following increased intracranial pressure is a constant phenomenon experimentally when the anesthesia is not deep enough to block the corneal reflex or the reaction of the pupil to light, but is absent when the anesthesia is deep. The depressor fibres in the vagus inhibit the rise of blood pressure following increased intracranial pressure. Clinically, blood pressure compensation following increased intracranial pressure is a valuable criterion of the degree of cerebral compression when the pupils react to light, but is of no service when they do not. A sluggish or absent reaction of the pupils to light indicates a grave prognosis and no time should be lost in relieving the cerebral compression. It has been an almost invariable rule, however, on the neurosurgical service not to decompress a patient if the blood pressure is falling or is below normal. This has been taken as evidence that the last stage of compression has been reached and that the medullary centres are exhausted and can no longer compensate.

High Blood Pressure and Uterine Fibroids.—J Heitz (*Bulletin de l'Académie de médecine,* April 18, 1922) lays stress on hypertension as an accompaniment or sequela of fibroids of the uterus. Out of 208 women whose systolic and diastolic pressures had on repeated examination exceeded 160 and 100 mm., respectively, forty-five had fibroids at the time or had been treated surgically or medically for the condition. Out of these forty-five, twenty-five had constantly pressures exceeding 200 and 110. Five possibilities accounting for this blood pressure relationship may be thought of: suppression of menses, causing a kind of plethora; premature loss of ovarian function; pressure of the growth on the ureters, reacting on the kidneys and hence on the cardiovascular system; some unknown cause of the fibroid and the hypertension, and lastly, disturbance of the chromaffin tissue in the vicinity of the uterus, Marchand's bodies in the broad ligaments constituting actual reserve deposits of adrenalin. The author has been struck by the large proportion of cases of high blood pressure in women who had been subjected to hysterectomy for severe hemorrhages. In cases of fibroids with hemorrhage it would seem wise to forego radical procedures and resort rather to x ray treatment, administered gradually at repeated sittings instead of in massive doses. The circulatory function should be examined in all women with fibroids. Even when the blood pressure is normal after hemorrhage has been arrested and the size of the growth reduced, it should be remembered that the pressure may rise, either intermittently or permanently, in succeeding months or after one or more years. All these patients should be kept under observation for a prolonged period. By forbidding fatiguing pursuits, prescribing a suitable diet and certain physical measures, and in the more severe cases effecting small monthly bleedings, the physician will be able to prolong the period of tolerance and postpone the appearance of the serious renal, cerebral, and cardiac manifestations often witnessed in the permanent stage of arterial hypertension.

Testing the Function of the Heart with the Plethysmographic Curve of Work.—Paul Liebesny and Ferdinand Scheminzky (*Wiener Archiv für Innere Medizin,* April 5, 1922) showed that the changes in the arm plethysmograms following isolated muscle work of the foot are not uniform either in the healthy or in the diseased person. The psychic effect is very difficult to exclude and therefore the clinical value of this test is limited in patients: those with labile vascular tone easily show the characteristic wave change described by Weber, but it cannot be found in persons with a tardy vascular reaction.

Aneurysm of Internal Carotid.—N. Winslow (*Annals of Surgery,* June, 1922) concludes as follows: 1. Aneurysm of the cervical portion of the internal carotid artery is not as infrequent as supposed. 2. Before incising a unilateral lump in the neighborhood of the tonsil, especially if of long standing, look, feel, listen. 3. Spontaneous cure may occur, but the usual termination in untreated cases is death from rupture into the fauces. 4. The operation of choice is occlusion of the internal carotid proximal to the sac. If this be impossible then ligation of the common carotid artery, together with a ligation of the external carotid, between its origin and first branch. If the external carotid be tied distal to a branch, that branch must likewise be occluded. 5. After ligation the prognosis is fair both as regards operative recovery and permanent cure. 6. Aneurysm in other localities is by far more prevalent in the male than in the female; in the internal carotid it occurs in almost an equal ratio in the two sexes, being slightly more prevalent in the male if all types are considered, but much more frequently in the female in the spontaneous variety.

Velocity of Transmission of the Pulse Wave and Elasticity of Arteries.—J. Crighton Bramwell and A. V. Hill (*Lancet,* May 6, 1922) state that in many cases of arteriosclerosis the diagnosis has to be based on circumstantial evidence, such as hypertension or the associated diseases, such as chronic interstitial nephritis and gout. In such cases the evidence obtained by measuring the velocity of transmission of the pulse wave is very valuable. This determination is also of value in the diagnosis of aneurysm, where the progress of the pulse wave is delayed. Such a delay may be obvious to the finger, but very often it is so small as to be determined only by instrumental methods, as with the hot wire sphygmograph. In health there is a definite relationship between age and pulse wave velocity, but this is not so in disease. The pulse wave velocity is an index of arterial elasticity—a very important factor in circulatory efficiency. Direct measurements of the pulse wave velocity agree closely with the values obtained by the hot wire sphygmograph. This measurement affords evidence of arteriosclerosis and aneurysm.

Hyperglycemia in Disease Conditions with Hypertonia.—H. Kohler (*Wiener Archiv für Innere Medizin,* April 5, 1922) asserts that in the majority of cases of lasting hypertonia, the fasting value for the blood sugar lies within normal limits. Hyperglycemia occurs first of all in complicating diseases, as in the beginning of an attack of apoplexy and in eclamptic and uremic conditions; also in individual cases of socalled essential hypertonia, in which a sclerosis of the pancreatic vessels is assumed and finally in hypertonic stasis. There is no difference between the effect of experimental injections of adrenalin in individuals with normal blood pressure and those with hypertonia. This fact and also the absence of hyperglycemia in uncomplicated cases make the assumption of a hyperadrenalinemia as the cause of the increased blood pressure untenable. In hypertonic stasis, there is always hyperglycemia; this can be explained neither by the dyspnea nor by the liver stasis, as was seen in experimental controls. Possibly a hyperadrenalinemia occurs in these cases.

Adrenalin in the Stokes-Adams Syndrome.—Arthur G. Phear and John Parkinson (*Lancet,* May 13, 1922), show from clinical evidence that partial block can be reduced and even complete heart block abolished by subcutaneous injections of adrenalin, even though it frequently fails owing to the pathological condition present. However, an increased ventricular rate is usually obtainable despite the block, which in itself is sufficient reason for an extended trial of adrenalin in these attacks, where the immediate cause of unconsciousness is usually extreme ventricular slowing and standstill. In a case reported this was actually accomplished.

RESPIRATORY DISEASES

Construction of an Oxygen Chamber for the Treatment of Pneumonia.—William C. Stadie (*Journal of Experimental Medicine,* March, 1922) describes the construction of an oxygen chamber, which can be quickly filled with oxygen to any concentration up to sixty-five per cent., and maintained at the desired concentration for an indefinite time. This chamber is designed so that pneumonia patients with anoxemia may be placed in it and breathe an atmosphere containing forty to sixty per cent. of oxygen. It has the advantages of being easy of ingress and egress, economical in cost of operation, and comfortable for patient and attendant. The author also gives the construction of ventilating system, cooling device, carbon dioxide remover, automatic oxygen analyzer, and filling and maintaining devices.

Dissemination of Bacteria in Upper Air Passages.—Arthur L. Bloomfield (*Bulletin of the Johns Hopkins Hospital,* April, 1922) used sarcina lutea as the test organism in these experiments. Organisms thoroughly implanted on various areas in the mouth and pharynx adhered at the site of inoculation. The experiments showed that even when the organisms are introduced in a fluid medium that they are carried directly back by the act of swallowing with but little contamination of, or at least, little tendency to adhere to the tonsils, pharynx, or sublingual space. If, however, they are once anchored in the mucous lining of the buccal cavity they are no longer readily dislodged, at least by flushing with fluid. It is concluded that there is a definite mechanism whereby foreign organisms which enter the mouth are removed, its essential feature being a direct and rapid transport of the bacteria towards the esophagus. It appears probable that they are swallowed after reaching this point.

Pneumothorax Treatment of Tuberculosis.—H. C. Jacobaeus (*Surgery, Gynecology and Obstetrics,* June, 1921), in a consideration of the cauterization of adhesions in pneumothorax treatment of tuberculosis, states that in summarizing the data in the forty cases in which operation was performed, it is seen that in thirty the purpose of the operation was attained. Complete or sufficient compression of the lung was obtained in twenty-seven of thirty-seven cases of adhesions to the apex and the lateral chest wall. The aim of operation was attained in all three cases of adhesion to the diaphragm; but in only one was a corresponding practical and valuable result gained. From these thirty cases four must be deducted in which operation was followed by a complicating serous pleurisy or tuberculous empyema, with serious consequences to the patients. In twenty-six of forty cases, therefore, a satisfactory pneumothorax was obtained, and the operation was of genuine benefit. The early convalescence was favorable in all cases except in the five mentioned; later on, however, it was highly variable, depending on other factors, especially on the condition of the other lung. No résumé was made of the lasting results with regard to the pneumothorax treatment in these cases It would naturally be of interest to see whether the lasting result would be better in these cases than in pneumothorax cases in which this operation was not performed, but as yet there are not sufficient statistics for such a comparison The statistics of the immediate effect of the operation, however, should be sufficient to justify the operation as an adjunct in the pneumothorax treatment of pulmonary tuberculosis. The indications and contraindications for the operation, as far as it is possible to give them, can be found in the description of the different cases. The stringlike and membranelike adhesions are the best subjects for the operation. Surface adhesions also are adapted for cauterization to a certain extent, but nothing can be said with certainty in advance as to the prospect of success. In four cases the author cauterized surface adhesions in two sittings; and it is quite possible that the use of the method can be extended in this way.

Acute Lobar Pneumonia and Hematogenous Puerperal Infection.—R. A. Johnston and H. J. Morgan (*Bulletin of the Johns Hopkins Hospital,* March, 1922) present a case of acute lobar pneumonia (type I) with septicemia as a complication of the puerperium, demonstrating that a hematogenous (pneumococcus type I) endometritis developed and disappeared under observation. The essential points in the patient's history are as follows: She was a thirty-five year old primipara; difficult labor with prolonged second state; chloroform anesthesia; low forceps delivery; immediate development of signs of acute lobar pneumonia; pneumococcus (type I) septicemia; pneumococcus type I endometritis; antipneumococcus (type I) serum therapy followed by rapid disappearance of organisms from the blood stream; prolonged course suggesting "delayed resolution;" recovery from endometritis; serum sickness; suggestive evidence of empyema; terminal hemolytic streptooccus septicemia; no autopsy. The authors review the literature on pneumococcus puerperal infections, and cite instances of both secondary (hematogenous) and primary (vaginal) route types. They suggest that the possibility of a pneumococcus puerperal infection should be borne in mind when dealing with patients in whom abortion or term delivery has occurred during the course of acute lobar pneumonia.

RADIOLOGY

Radium and X Ray Treatment of Uterine Carcinoma Causing Histological Changes.—Frank and Amreich (*Surgery, Gynecology and Obstetrics,* December, 1921) state that in x ray and radium treatment of carcinoma of the uterus there are distinct differences between direct and indirect ray treatment. Carcinoma cells respond more quickly to the action of the x ray than to radium and do not show the stage marked by the swelling of the cell body. These facts induce us to advise the use of the x ray in treating the parametrium and the glands, while radium is preferable in treatment of the carcinomatous crater.

X Ray in Hyperemesis Gravidarum.—Manfred Fraenkel (*Zentralblatt für Gynäkologie,* April 29, 1922) tried the effect of x rays in four cases. He protected the rest of the abdomen and after applying the x rays in two sittings, each with one-half unit doses at an interval of five days with hard, filtered rays, in the region of the stomach, the vomiting suddenly stopped. No harmful effects on the infants were noted. The question arises whether the radiation really reduces the irritation or whether the benefit is the result of suggestion.

Treatment of Rectal Injuries After Radiation.—W. Kolde (*Zentralblatt für Gynäkologie,* April 15, 1922) had occasion to treat two cases of injuries of the rectum following radiation. The first case showed a rectal ulcer and the other showed a large defect of the rectum with a rectovaginal fistula. In the first case he cured a pea sized ulcer, due to x ray and radium treatment, in two months with the high frequency current. An amenorrhea following the original treatment was also favorably influenced by diathermy treatment, probably as a result of Joule's heat. The second case was that of a woman who was treated with mesothorium for carcinoma of the cervix, in whom a rectovaginal fistula resulted from displacement of the tube of mesothorium. Under local anesthesia an artificial anus was made in the region of the sigmoid as a temporary measure, but she was so satisfied with this result that she refused further operation. The carcinoma healed entirely in the meantime. This patient may have been saved much inconvenience by earlier diathermy treatment to prevent necrosis and an early sigmoidostomy.

Heliotherapy.—J. Harry Bendes (*Minnesota Medicine,* May, 1922) describes Rollière's technic which he follows. Blondes and persons with red hair are inclined to burn instead of tan; these patients are put on a diet of carrots and spinach to produce a carotinemia and a deposit of pigment in the skin. This enables them to produce a deep tan the degree of which is an index to the progress the patient is making. For deep seated tuberculous lesions, indolent ulcers, sinuses, localized pain and sluggish wounds a biconvex lens is used with a diameter of twelve inches and a focal point of seventy-two inches. The lens is focused over the site of the lesion so as to obtain a circle seven inches in diameter. If this circle is less than seven inches the heat is so great as to be uncomfortable, and if more than eight inches it is not efficacious. The treatment with the lens is started at five minutes, and increased five minutes daily until thirty minutes are given, and then a thirty minute treatment is given morning and afternoon. The effect on pain and healing is very striking. The mercury quartz vapor lamp is used as a substitute for the sun on cloudy days and in winter.

SURGERY

Adaptation of Amputation Stumps.—C. Bearse (*Surgery, Gynecology and Obstetrics,* April, 1922) in a detailed study of amputation stumps for each segment of each member gives the following rules: 1. Do not lose sight of your patient after an amputation until a properly fitted limb has been prescribed and is worn; the sooner it is worn, the better. 2. Instruct patients that if at any later date they have pain, to return to you—and not to the limbmaker. 3. There are no standardized apparatus for stumps of the upper extremity; generally speaking save as much as possible, avoiding joints. 4. On the lower extremity avoid the tarsal amputations—nothing is gained by using them, and there may be disagreeable complications. 5. The success of the Symes depends upon its being end bearing; if doubtful about the outcome, amputate at the point of election. 6. The ideal site of amputation in the leg is six to eight inches below the knee; try not to make the stump any shorter and there is nothing gained by having it longer—it may be detrimental. 7. In treating stump complications, it should always be borne in mind that the longer the patient goes without his artificial limb, the longer it will take him to become accustomed to wearing it again.

Use of the Bone Graft in the Treatment of Pott's Disease.—William S. Baer (*Bulletin of the Johns Hopkins Hospital,* April, 1922), has collected fifty cases of tuberculosis of the spine treated by himself and his associate, Dr. Bennett, in which the bone graft operation has been done prior to December 31, 1919. Consequently two years or more have passed in every case since the operation. A careful analytical study of the results obtained shows that in patients up to six years of age, the operation is questionable, because of its magnitude, and the tendency to weaken the system, and make the patient more liable to the spread of tuberculosis and to secondary infections. In these cases the ultimate, if not the immediate mortality, was high. Patients from six to sixteen, the period of growth, are somewhat more favorable subjects for the operation, and in carefully selected cases the bone graft may be used, but Baer emphasizes that it should be considered only as an aid, and proper mechanical treatment must be kept up until the period of growth is over or amalgamation of the vertebræ has occurred. In adults the bone graft is indicated in the majority of cases, good results having been obtained in this group in ninety per cent. of the patients, but even here Baer recommends mechanical support for at least six months. In contradistinction to Albee, Baer believes that in Pott's disease operative procedures should be used in selected cases only, and simply as an aid in making the cure, but not as the chief means. As the disease runs such a long course, and its cure is only accomplished when amalgamation of the vertebral bodies is assured, he considers mechanical means must be the main method for stabilization of the vertebræ and when the graft is used, it must not be relied upon alone.

Tendon Transplantation.—L. Mayer (*Surgery, Gynecology and Obstetrics,* November, 1921) states that in the development of the physiological method of tendon transplantation, lies an unusual opportunity for the application of a rational surgical technic to paralytic and traumatic conditions. The essential principle of the method is the correlation of each step of the operation with the known facts of tendon anatomy and physiology, in particular the retention of the normal gliding mechanism of the tendon. Applied to the residual paralyses of poliomyelitis and of gunshot injuries as well as to traumatic injuries, the method has yielded consistently good results. It must be emphasized, however, that the operations are technically difficult, that they require intimate knowledge of the finer details of tendon anatomy and considerable practice on the cadaver. Furthermore, that in the postoperative care as well as in the proper selection of cases, attention to detail is as important as in the execution of the operation.

Experimental Pyloroplasty.—Miller, Bowing and Stepp (*Surgery, Gynecology and Obstetrics,* June, 1922) present the following conclusions: 1. A plastic flap operation or the Heineke-Mikulicz operation can secure, temporarily, a true enlargement of the pylorus, if the edges sutured are not turned in. 2. A normal pylorus, enlarged by any of the foregoing procedures, except the Rammstedt, tends to return toward its normal size. Whether a stenosed pylorus, thus operated upon, would return to its former stenosed condition or would retain a lumen of normal size, is still uncertain. 3. A plastic flap operation is unsatisfactory on account of requiring such extensive incisions into the lumen of the canal. It is also unsatisfactory on account of its tendency to retract and restore the divided pyloric sphincter. 4. The Rammstedt operation, or socalled partial pyloroplasty, is, when conditions will permit, the most effective way of enlarging the pylorus. It has the advantage of being the simplest operation yet devised for this purpose and requires very little time under anesthesia. The objections sometimes raised are: 1. danger of hemorrhage from the exposed submucosa; 2, danger of peritonitis from puncture of the mucosa; 3, recurrence of stenosis; 4, danger of rupture at the weak spot created. The first two of these dangers can be avoided if extreme care is used in performing the operation. The third has already been answered clinically. The fourth is shown to be unfounded on account of the large factor of strength residing in the submucosa. The authors believe that the principle of the Rammstedt operation should not be confined entirely to cases of congenital stenosis but should be given more general application in the surgery of the pylorus.

Surgical Treatment of Pelvic Infections.—F. G. Duboise (*Surgery, Gynecology, and Obstetrics,* September, 1921) gives the following procedures in the treatment of pelvic infections: Failure to remove the focus of infection renders the operation relatively valueless; for when the source remains it is to be expected that the severity of the infection will increase, the contiguous structures will become involved, and remote metastases will more certainly result. Pelvic débridement is urged, at least the pyogenic membranes with infected tubes, uterus, and ovaries should be removed. Gauze packs are applied over denuded pelvic surfaces to stop oozing and to hinder capillary absorption, thus limiting further extension of the infection. Eroded or denuded intestinal surfaces are peritonized, or overlaid with omentum. Rubber dam covers the gauze packs and the pelvic operative field, minimizes the formation of adhesions, and drains freely and continuously. The gauze and rubber ends are brought out through the lower end of the incision, and transfixed with a safety pin. The abdominal incision is closed in layers and snugly around the drains. The dressings over the incision should be voluminous, and changed as often as soiled to keep up capillary suction. The results which have followed this plan are the saving of life, shortening to a marked degree the postoperative period of recovery, the elimination of a prolonged morbidity, the relatively earlier restoration to health, and resumption of the normal activities of the woman.

Life Expectancy in Breast Operations.—Sisrunk and MacCarthy (*Annals of Surgery,* January, 1922) report that the three greatest single factors in increased postoperative longevity of the ninety-one patients with mammary cancers are cellular differentiation, hyalinization and fibrosis.

2. Lymphocytic infiltration alone does not appear to be the main factor.

3. It appears that while hyalinization and fibrosis play, individually, some part in increasing longevity in cases of cancer of the breast the two greatest known combined factors are cellular differentiation and hyalinization.

A New Skin Suture Material.—Edward H. Ochsner (*Illinois Medical Journal,* April, 1920) describes a suture material made by treating silk chemically so that the tissue cells cannot penetrate the meshes of the silk. It has been named equisetene or horsehair substitute, and it is stronger than horsehair, of uniform strength, and can be cut to any length desired. Ochsner believes this material to be as near the ideal as it is possible to come.

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NEW YORK, WEDNESDAY, AUGUST 16, 1922

MISCELLANEOUS

Aminoacids in Cow's Milk.—Thomas P. Nash (*Journal of Biological Chemistry*, March, 1922) has found the following aminoacids in cow's milk: lysine, arginine and histidine; monoamino acids are probably also present.

Effect of Heat and Oxidation Upon the Antiscorbutic Vitamine.—R. Adams Dutcher, H. M. Harshaw and J. S. Hall (*Journal of Biological Chemistry*, August, 1921) found that the antiscorbutic vitamine was not destroyed by heating at pasteurization temperature, 63°, for thirty minutes in closed vessels, or by boiling at 100° for thirty minutes under reflex condensers. Hydrogen peroxide possessed some destructive action when added to orange juice at room temperature, and the destructive action is increased when the orange juice hydrogen peroxide mixture is heated at 63° and 100° C. It therefore appears that the antiscorbutic properties of orange juice are susceptible to oxidation, but in the absence of oxidizing agents are stable to heat up to the boiling temperature of orange juice.

Water Soluble B in Cabbage and Onion.—Bertha K. Whipple (*Journal of Biological Chemistry*, October, 1920) states that water soluble B in cabbage is not destroyed by boiling for thirty to sixty minutes, nor is it destroyed by boiling with acid or alkali. Water soluble B, present in onions, is also not destroyed by boiling. Not more than half of the water soluble B was lost in the cooking water from cabbage or onions boiled thirty minutes.

Salt Solution in Increased Intracranial Tension.—F. E. B. Foley (*Surgery, Gynecology, and Obstetrics*, August, 1921) states that in the human subject intravenous injection of hypertonic salt solution or the ingestion of salt produces a fall of cerebrospinal fluid pressure and a diminution of brain bulk. In conditions of pathologically increased tension the response is conditioned by the details of the pathological alterations. The determining factors appear to be the size of the lesion which increases brain bulk and the amount of fluid available for absorption. The induced fall of pressure is inversely proportionate to the former and directly proportionate to the latter. A distinction is made between increased intracranial fluid tension *per se* and increased intracranial tension which is due to enlargement of brain bulk. From observations of cases of obstructed and dilated ventricles an intraventricular absorption of fluid following salt ingestion seems to occur. The procedure has a definite field of clinical usefulness in cases exhibiting high grades of intracranial pressure. The most striking results are to be obtained in those cases in which cerebrospinal fluid obstruction exists.

Granuloma Inguinale.—Randall, Small and Beck (*Surgery, Gynecology and Obstetrics*, June, 1922) state that granuloma inguinale, long considered a tropical disease, is endemic in the temperate zone of the United States, and that its diagnosis is dependent on the characteristic local lesion, the marked predominance in the negro race, and the finding of the specific organism originally described by Donovan. These organisms were demonstrated in smears from granuloma lesions in twelve patients in a series of sixteen. In the other four instances laboratory examinations were not made. An encapsulated bacillus, which when stained from cultures, resembles this organism, has been isolated from three of the twelve patients studied culturally. This bacillus is a member of the bacillus mucous capsulatus group. The question remains as to whether the organism seen in smears and that obtained in cultures, which appear so similar, are identical. Abscesses with spontaneous rupture and ulcer formation have been produced in rabbits by subcutaneous inoculation. These heal spontaneously in from three to seven weeks and grossly cannot be regarded as granulomata although the walls of these abscesses on histological examination present granulation tissue not to be differentiated from that of the granuloma lesions. Friedländer's bacillus forms similar lesions. A few experiments attempting to establish symbiotic relationships between the encapsulated bacilli from granuloma lesions and staphylococci, colon bacilli, and diphtheroids in experimental lesions have failed. More work of this nature should be undertaken. Treatment with tartar emetic intravenously acts as a specific, and rapid healing may be expected with the prompt disappearance of the specific organism. The authors state that they have experienced no contraindication to the intravenous use of this drug up to doses as high as one tenth gram.

Breast Tumors.—R. Winslow (*Annals of Surgery*, November, 1921) from an analysis of one hundred and two cases of tumors of the breast presents the following conclusions: 1. Carcinoma is the predominant neoplasm of the mammary gland, occurring in from sixty to sixty-five per cent. of all mammary tumors. 2. While breast tumors are coming under observation earlier than was formerly the case, there has been no marked difference between the time at which this series of cases came under surgical care and that of the series collected in 1911. 3. Sarcoma occurs in about three per cent. of tumors of the breast. This condition is malignant and should be treated in as radical a manner as a carcinoma. 4. Nonmalignant neoplasms occur in about thirty-five per cent. of all cases. No woman should be allowed to harbor a neoplasm in her breast, whether it is benign or malignant, or whether she is young or old. Sooner or later benign tumors tend to become malignant; and the time to remove them is while they are still benign. One woman in this series had had a tumor in her breast forty-nine years. 5. It is unsafe to trust to the macroscopic diagnosis of tumors, a microscopical examination of frozen sections should be made, at the time of operation, of all neoplasms of the breast of which there is any doubt as to their malignancy. 6. Should the breast of a child approaching puberty be amputated for a uniform enlargement or should operation be delayed until it is evident that the enlargement is not due to physiological conditions? 7. The question of the proper treatment of primary or secondary tumors of the sternum is open to debate. Should extirpation be undertaken or should they be treated with radium or x rays? 8. Equally as serious, and even more frequent, is the extension of cancer from breast to ribs.

Fat Necrosis of Female Breast.—Lee and Adair (*Surgery, Gynecology and Obstetrics*, April, 1922) from a study of three cases in addition to those previously presented state that the present study furnishes important additional evidence that traumatic fat necrosis of the female breast is a disease not infrequently encountered, and one which must always be carefully differentiated from carcinoma. They express the hope that this report may stimulate surgeons and pathologists to a more careful scrutiny of the gross and microscopical pathology of all tumors of the breast in the belief that a thorough search for evidence will reveal many cases of this disease hitherto unrecognized, and suggest the possibility that some cases which in the past may have been diagnosed by the gross picture alone as carcinoma of the breast may not have been cancerous in their nature at all, but perhaps true examples of traumatic fat necrosis.

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Further Pathological Studies in Dementia Præcox, Especially in Relation to the Interstitial Cells of Leydig

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Madrid.

PART I: HISTOLOGICAL APPEARANCES OF THE INTERSTITIAL CELLS IN THE DIFFERENT FORMS OF INSANITY.

By Sir Frederick Mott.

Having in previous communications paid especial attention to the arrest of spermatogenesis and regressive atrophy of the spermatic tubes, and having only made some brief references to the morbid changes in the interstitial cells in various forms of mental disease, I thought it would be of interest to systematically examine, describe and compare the histological appearances of the interstitial cells in the different forms of insanity with the normal at different ages and with one another. The literature is fully considered by Dr. Miguel Prados y Such in Part II.

THE INTERSTITIAL CELLS OF LEYDIG.

The interstitial cells of Leydig are polygonal in shape with a round nucleus. The cytoplasm of the mature cell is considerable, and contains a substance which takes the eosin stain remarkably well. Consequently sections stained by hematoxylin eosin, or Heidenhain hematoxylin eosin, show the interstitial cells remarkably well.

I have examined all the material of the hundred cases of patients dying in hospitals or asylums with the view of determining more precisely the condition of the interstitial cells in relation to spermatogenesis.

THE LEYDIG CELLS IN THE PREPUBERTAL PERIOD OF LIFE.

At birth the testis consists of the spermatic tubes, made up of a delicate basement membrane containing embryonic, undifferentiated, rather small, epithelial cells, consisting mainly of nucleus with a well marked chromatin skein. There is abundant loose intertubular connective tissue in which are seen columns, islands and islets of cells, the polygonal outlines of which are quite distinct; the cytoplasm is stained pink, and in the centre is a round nucleus, with a well developed nuclear membrane containing a chromatin network, both of which are stained deep blue by the basic dye. No nucleolus is visible (Fig. 1). Lipoid granules are visible in many of the cells as revealed by scharlach stained frozen sections, and by vacuoles in hematoxylin eosin stained sections mounted in Canada balsam.

NORMAL TESTIS AT BIRTH.

The embryonic tubules, and between them the interstitial tissue, which consists almost entirely of interstitial cells, isolated or in groups, with distinct polygonal outline of cytoplasm stained by the eosin, or a nucleated vacuolated syncytium of what was originally polygonal cells. I shall speak of a syncytium because when the cells are distinctly vacuolated their outline is illdefined, and they appear to be interconnected. The nuclei in this unstained or faintly stained syncytium are of varied size and shape; many of these are only faintly stained by the basic dye and are deficient in chromatin, and the appearances are not unlike those observed in the regressive atrophy of dementia præcox. Where this is taking place there are a number of more deeply stained nuclei of fibroblasts. This is the final stage of regressive atrophy. In other places one sees the earlier stage of regressive atrophy, viz., groups of polygonal cells with the cytoplasm faintly stained pink, and the nuclei hardly stained and appearing only very pale blue; in the immediate neighborhood of these are mature polygonal cells with pink cytoplasm and round nuclei with chromatin network well stained. In these cells which are undergoing regressive atrophy the nuclei instead of being round are irregular in outline, crenated and polymorphic. Here we have all stages of regressive atrophy of the interstitial cells seen in dementia præcox (except pigmentary degeneration), but this

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is a physiological and not a pathological process. It will be interesting to trace the further stages of the disappearance of these cells after birth.

PRUPUBERTAL DISAPPEARANCE OF LEYDIG CELLS.

The interstitial cells at four months.—Examination of sections of the testis of an infant aged four months showed that the tubules are now twice the size owing to proliferation of the embryonic epithelial cells and are closely approximated. This is due to the almost complete disappearance of the interstitial cells of Leydig (Fig. 2 to compare with Fig. 1). Sections examined with an oil immersion lens show oval and round nuclei lying in a vacuolated syncytium, but no pronounced eosin stained cells can be seen. These nuclei are not connective tissue nuclei but the nuclei of the Leydig cells. Frozen sections stained with scharlach show lipoid granules corresponding to the vacuoles. Examination of the tubules with an oil immersion shows numbers of very fine lipoid granules in the syncytium of embryonic cells. The presence of lipoid granules in this situation and in the interstitial tissue and Leydig cells, shows that the formative process is still proceeding, but the size and close proximity of the tubules is indicative of its terminal phase. I have been unable, owing to my not having the material, to trace the stages of regressive atrophy between birth and four months and after this time to ten years.

The interstitial cells at ten years.—Examination of sections of the testis of a boy aged ten who died of fracture of the base of the skull. The tubules are not any larger in some portions of the section than those found in the testis of an infant aged four months and show no more differentiation of structure. Occasionally one finds the first evidence of differentiation by the appearance now and then of definite spermatogonia and some of the cells show mitotic figures. In some parts of the organ the tubules are closely approximated and the appearances resemble those described as occurring at four months. In other parts the tubules are separated by a considerable amount of interstitial tissue and groups of polymorph oval and round nuclei, like those of immature Leydig cells, can be seen, but only very occasionally can a small polygonal cell with pink cytoplasm and a round central nucleus be observed. The interstitial tissue contains no lipoid, for frozen sections stained by Sudan III show no fat in the tubules or interstitial tissue. Function has not therefore commenced in the interstitial cells. As the Sertoli cells do not appear to be present yet, it seems probable that with their appearance the Leydig cells would mature and function, but further observations at later ages are necessary to determine whether this is so. I have taken some pains to show the conditions of the interstitial cells in the prepubertal period of life because after birth there is a regressive atrophy and cessation of function, and the appearance presented by the interstitial tissues, at birth and afterwards, in a way correspond to the appearances met with in the regressive atrophy of the interstitial cells in dementia præcox. Moreover, the fact that the development of the spermatic epithelium corresponds with the appearance of lipoid in the interstitial cells and the tubules, and its absence with the signs of an absence of formative activity in the tubular epithelium, supports the view that these cells of Leydig perform the double function of providing a hormone and the raw material for formative activity of the spermatic epithelium.

LEYDIG CELLS IN THE PUBERTAL AND POSTPUBERTAL PERIOD.

The testis of a boy aged fifteen, who died from shock of injuries, showed active spermatogenesis, lipoid granules in the Sertoli cells and interstitial lipoid; this interstitial lipoid was found in drops and droplets in the lymphatics and lymphatic clefts, also in the Leydig cells, which have now reappeared in the interstitial tissue. Their reappearance is, therefore, synchronous with the first appearance of the secondary sexual characters which it has been proved they determine.

They were found subsequently at all ages up to extreme old age—eighty, eighty-five and eighty-six—though in diminished numbers and corresponding, generally speaking, with the degree of spermatogenic activity, although by no means always, for sometimes these cells could be found in fair numbers while there was little evidence of active spermatogenesis, and the converse. Mr. Kenneth Walker, who has been working in the Maudsley Laboratory on the prostate, has kindly furnished me with the following results, which are in accord with this conclusion (Table II). I am now only referring to patients dying in hospital and to certain asylum cases, but not to cases belonging to the biogenetic psychoses in which there is a partial or complete regressive atrophy.

I came to the conclusion from the examination of the testes of young adult patients dying from shock shortly after receiving severe injury and the testis of the boy above referred to, that these Leydig cells have a comparatively short life and are continually maturing, decaying and being renewed (Fig. 6A). All stages of small nuclei resulting from active division can be observed, followed by division of the cell and growth to the mature cell, such as was seen in the newborn child. The cytoplasm of the normal mature cell is abundant and is stained by the eosin dye a deep pink, so that with a low power, islands, columns and islets of cells can easily be recognized in the interstitial tissue.

When examined with an oil immersion details can be observed which cannot readily be seen with a low power, e. g., the amount of chromatin in the nucleus can be gauged and varying degrees of vacuolation in the cytoplasm corresponding to lipoidal contents can be estimated. I have come to the conclusion from my observations that vacuolation and disappearance of the pink cytoplasm is associated with a tendency to make the outline of the cells ragged or indistinct; and if marked, to convert the island of cells into a nucleated pale vacuolated syncytium.

THE LEYDIG CELLS IN PROLONGED SEPSIS.

I found this pale vacuolated syncytial condition in various cases of prolonged sepsis such as suppurative pericarditis with empyema, cerebrospinal meningitis and several cases of gunshot injury of the head. I regard the pink staining substance as the antecedent, if not the actual hormone material, therefore the above described condition of the Leydig's cells is indicative of an exhausted condition and temporary failure in their function; and associated therewith was an arrest of the final stages of spermatogenesis.

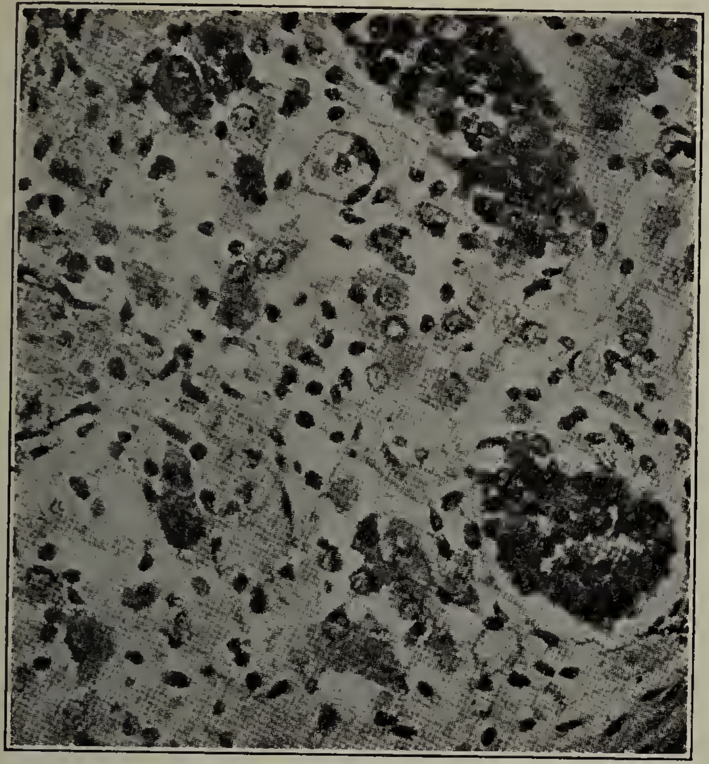

FIG. 1.—Photomicrograph of section of testis of newborn child. Showing embryonic tubules and polygonal mature interstitial cells with round nuclei. Many small immature cells are present but not so distinctly seen lying in loose areolar tissue. (Staining hematoxylin-eosin. Magnification 410.)

It may be hypothecated that the vital impulse of the social organism (the body) was all concentrated in an attempt to preserve the life of the individual; the formative energy of the testis being in abeyance, the vital energy of the sex instinct was available for prolonged formative cell activity of phagocytes and pus formation.

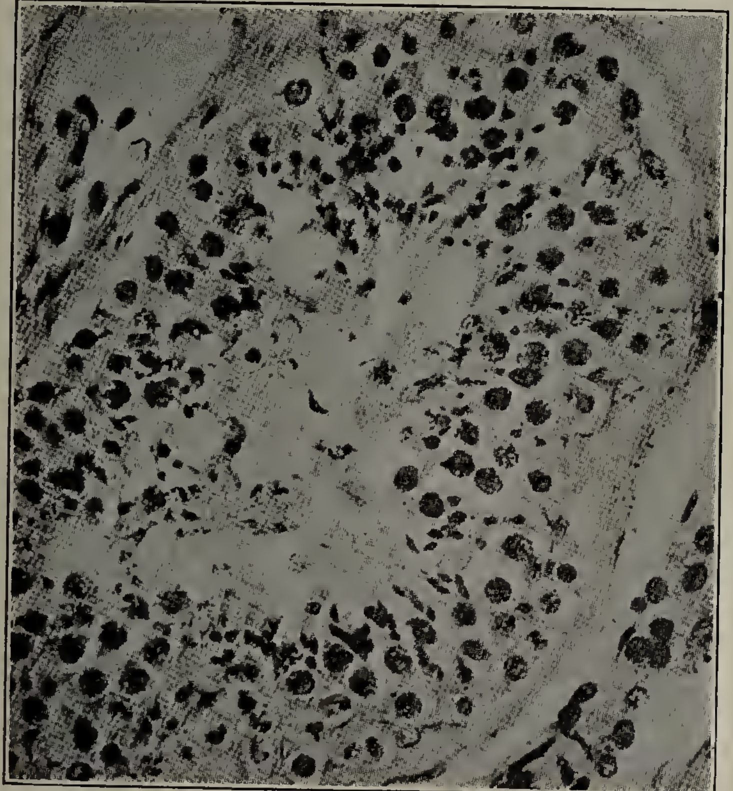

FIG. 3.—Photomicrograph of section of testis, Case VI, Table I. Low power, showing tubule with active spermatogenesis. In some places the spermatozoa are normal in appearance and staining reaction; in others they are of unequal size and abnormal form and staining. (Staining Heidenhain hematoxylin. Magnification 500.)

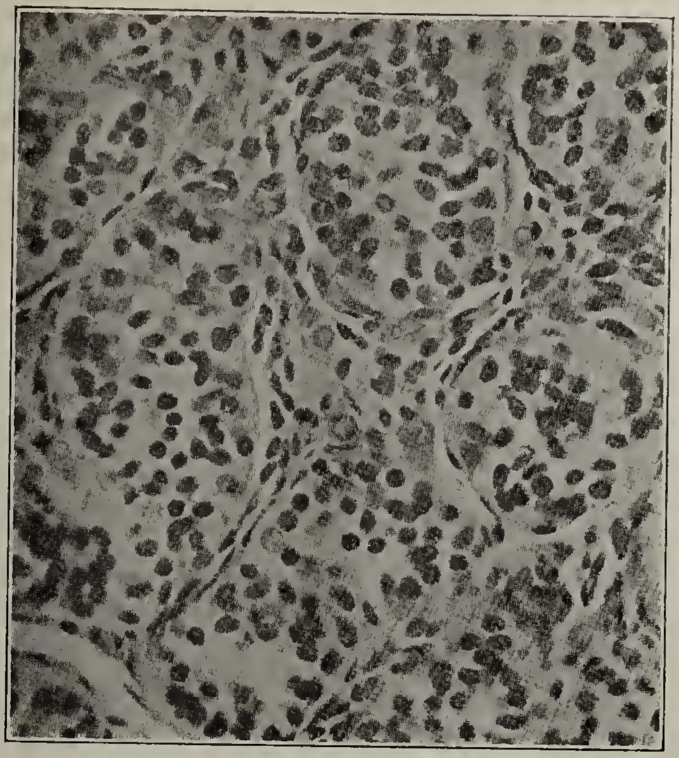

FIG. 2.—Photomicrograph of section of testis of child, aged four months. The tubules are nearly double the size and approximated; here and there are small areas containing a few small faint pink polygonal cells, but for the most part the normal interstitial cells have disappeared. The portion of the section in the centre containing the residue of the interstitial cells was found after search. (Staining hematoxylin-eosin. Magnification 430.)

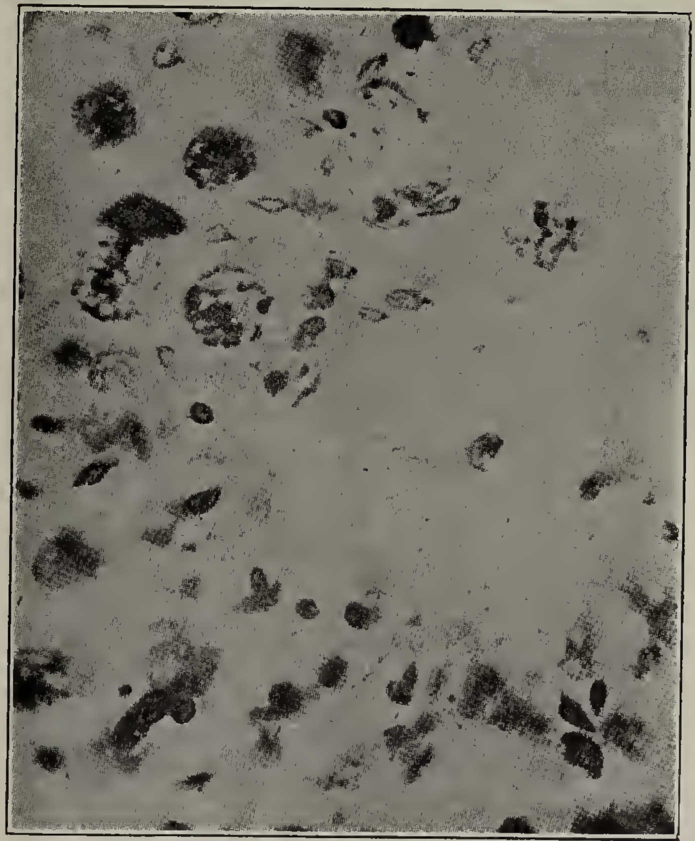

FIG. 4.—High power (oil immersion) of the same section, showing a group of these degenerated spermatozoa. Observe the heads of the spermatozoa are of unequal size and shape, and do not take the nuclear stain, although the chromatin in the adjacent cells is well stained. (Magnification 1,200.)

I have shown that in many fatal cases due to microbial invasion of the body, such as tuberculosis, pneumonia, bronchopneumonia, typhoid and dysentery, active spermatogenesis in all stages can be seen in the majority; in some, especially where death occurs within a short time of the onset of the disease, pink eosin stained islands and islets of Leydig cells are seen. Indeed, in a patient with infective endocarditis, aged twenty-one, in whom a cerebral aneurysm developed, and the patient died suddenly of apoplexy from its rupture, there appeared normal interstitial cells and normal active spermatogenesis. But as a rule the pathological changes indicating functional exhaustion of the interstitial cells are more marked when there are circulating microbial toxins from chronic diseases than can be observed in the epithelial cells of the spermatic tubes. The spermatogenic cells may be protected by the basement membrane and the abundance of lipoid cholesterin ester with which it is covered, both within and without.

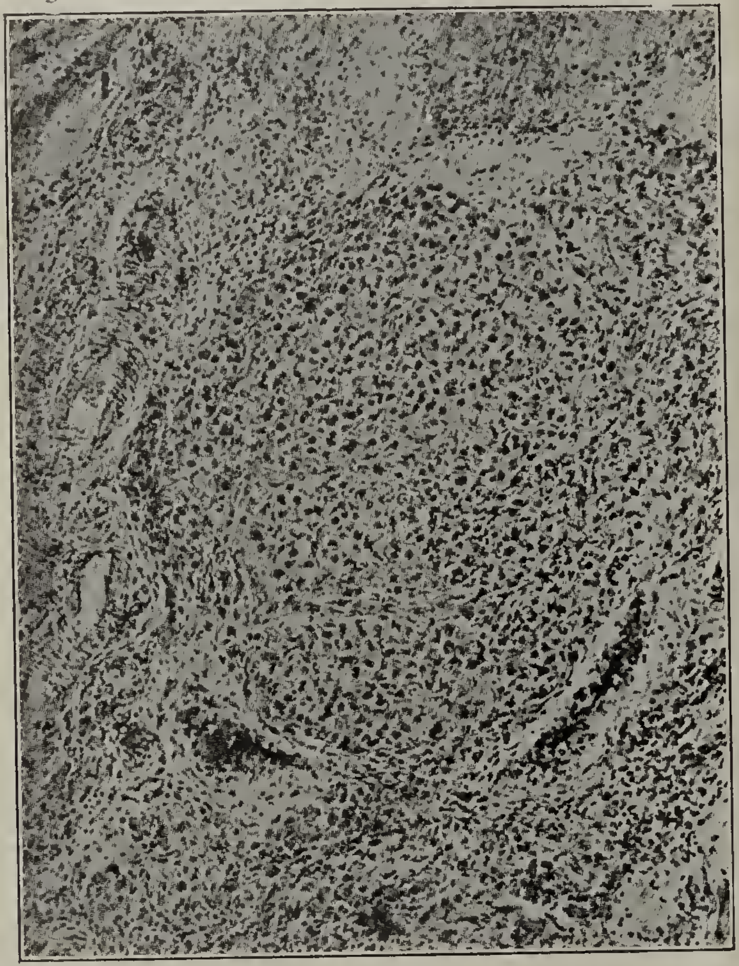
FIG. 5.—Photomicrograph of section of testis. Nodule of interstitial cells. Case XXV, Table II. Extreme atrophy of tubuli seminiferi. The interstitial cells form a nucleated syncytium. Some contain lipoid substance, and the cytoplasm does not stain with eosin. (Magnification 120.)

STRUCTURE OF THE BASEMENT MEMBRANE OF TUBULES AND ITS RELATION TO LYMPHATICS.

The basement membrane of the tubules appears to consist of a delicate connective tissue lined externally by flat endothelial cells (Fig. 6, A and B). When the membrane undergoes thickening owing to regressive atrophy of the spermatogenic cells, these structures undergo proliferation. In a patient with dementia præcox who died of chronic nephritis and in whom the testes showed microscopically advanced regressive atrophy, yet owing to the edema were nearly of normal weight (Table IV, No. 13), microscopic examination of sections of the organ showed that the thickened membrane was separated by the edema into layers. The Sertoli cells and spermatogonia rest therefore upon a layer of connective tissue and endothelial cells, external to which is a lymph space, the external wall of which is similar to that of the basement membrane. External to this lymphatic space, and resting upon it, are the Leydig cells. These anatomical dispositions can often be clearly made out in normal tissues. Examination of frozen sections stained with scharlach and hematoxylin shows drops and droplets of lipoid substance in this lymphatic space and in the lymphatic clefts of the interstitial tissue, also in the Leydig cells. Very fine droplets can be seen in the Sertoli cells, and these undoubtedly serve for the growth and development of the spermatozoa.

ORIGIN AND DESTINATION OF INTERSTITIAL LIPOID.

The question arises: Does this lipoid, which is seen in the interstitial lymphatics, serve as the raw material elaborated by the Leydig cells for spermatogenesis, or does it represent a waste product of spermatogenesis to be taken away by the circulation? The following arguments are in favor of the former hypothesis:

1. The correspondence between the disappearance of Leydig cells and cessation of spermatic epithelial growth.
2. The reappearance of Leydig cells before signs of spermatogenesis.
3. The presence of lipoid in the interstitial cells.
4. The presence of lipoid in the Sertoli cells when the remaining cells have undergone complete regressive atrophy, and when this occurs interstitial cells containing lipoid also exist.
5. The interstitial cells by this hypothesis would perform a double function, viz., by a decomposition of the eosin staining substance (corresponding to a zymogen) a hormone would escape into the circulation and the lipoid would pass into the lymphatic space surrounding the tubule and then into the Sertoli cells possibly by the active intervention of the endothelial cells.
6. In the undescended testis, the tubuli seminiferi are inactive and undeveloped but the interstitial hormone cells persist; they contain these lipoid granules, so that they retain the function of providing a sexual stimulant apart from spermatogenesis. They thus provide the mental and bodily conditions required for coitus. Not only do these cells retain their anabolic function of storage of the zymogen and production of hormone, but the presence of lipoid granules in their interior shows that in the undescended testis they retain a katabolic action in their interior. In the freemartin—a bull with undescended testis—I found a nonexistence of seminiferous tubules, but the gland consisted of fibrous tissue and fibroblasts, among which are large polygonal cells with round nuclei; many of these interstitial cells contained lipoid granules stained black by osmic acid.

TABLE II.—PERSONAL CASES OF MR. KENNETH WALKER, F.R.C.S.

Name	*Age*	*Spermatogenesis*	*Leydig cells*
1. G. C.	59	Active spermatogenesis	Scanty
2. A. (malignant prostate)	70	Some mitosis and a few spermatids seen	Increase of Leydig cells
3. T.	57	Spermatogenesis	Scanty
4. C.	46	Spermatogenesis	Fair number
5. K.	70	Spermatogenesis	Fair number
6. H.	80	Absent	Very scanty (marked mental symptoms)
7. T.	60	Present	Scanty
8. C.	60	Present	Fair number
9. B. (malignant)	66	Absent (some mitosis, no spermatozoa)	Scanty
10. T. (malignant)	63	Active	Fair number
11. K. (malignant)	86	Absent	A few degenerating cells only
12. T.	73	Present (becoming malignant)	Scanty
13. T.	68	Spermatids seen, no spermatozoa	Very scanty
14. Cancer Hospital (case of pancreas)	?	Spermatogenesis present	Leydig scanty

It is well known that cryptorchids have sexual desire, and that ligature of the vas deferens, on both sides, which causes complete obstructive atrophy of the tubules, and exposure of the testes to the x ray, which destroys spermatogenetic function, leave the interstitial cells intact and with their integrity the sexual appetite persists.

ANALOGY OF THE CELLS OF THE THECA INTERNA, GRAAFIAN FOLLICLES, AND LEYDIG CELLS.

Examination of the ripening graafian follicles shows that the cells of the theca interna take the eosin stain and that if the section be stained with scharlach it will be found that in these cells and between them and between the cells of the zona granulosa are numbers of lipoid granules.

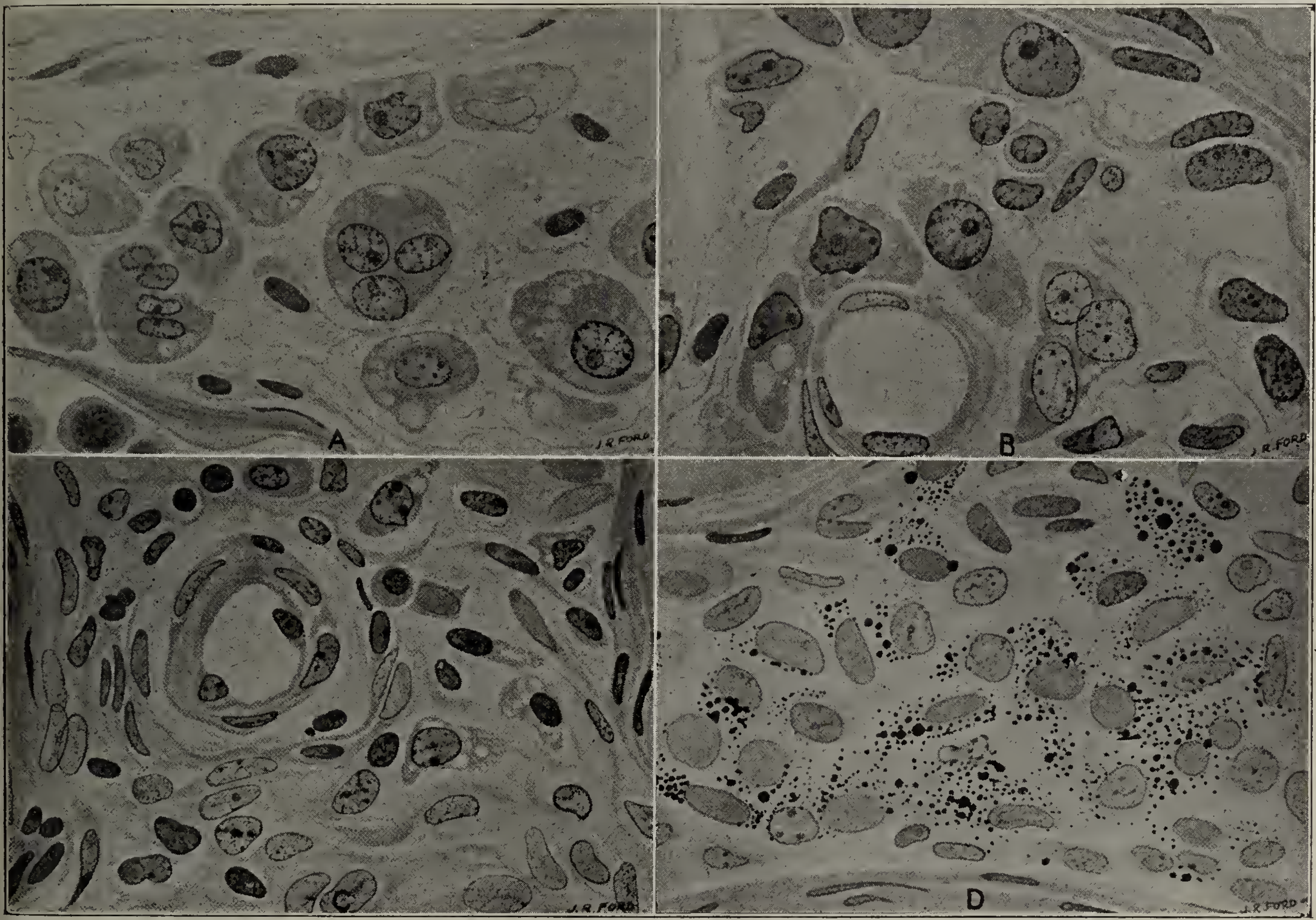

Fig. 6.—A. Section of testis from a case of death from shock due to severe injuries. A number of interstitial cells are seen of varying size. The eosin stained cytoplasm is vacuolated. The nuclei are well stained by the basophil dye, and show in two of the cells active mitosis.

B. Section of testis from Case VI, Table II. Many interstitial cells are seen around a small vessel. They are not so numerous as in Fig. 1, and there is a vacuolated syncytium in the lower part of the figure. The flattened cells of the basement membrane are increased.

C. Section of testis of dementia præcox advanced second stage. A small vessel in centre. Above thickened basement membrane with flattened nuclei a few small immature Leydig cells are seen. A few large with vacuoles. A large number of oval and polymorphic pale nuclei, some of which are fibroblastic, are seen. Compare with Figs. 1 and 2. The appearances are similar to the regressive atrophy of the interstitial cells seen in photomicrograph (Fig. 3) of the infant's testis at four months.

D. Section of testis of primary post-adolescent dementia, Table IV, Case X. Nearly all the interstitial cells are markedly pigmented. The nuclei are large, oval and pale, indicative of a deficiency of chromatin.

All the specimens were stained with hematoxylin eosin, and the magnification one twelfth oil immersion, and No. 4 ocular Zeiss.

A section of the ovary of a child aged eighteen months shows the eosin stained theca interna surrounding a graafian follicle. Inasmuch as from early infancy onward graafian follicles with these cells of the theca interna are continually formed, it may be presumed that they have a function. Now the somatic cells possess both male and female characters but the male are dominant; it seems, therefore, probable that these thecal cells are continually being formed under the stimulus of follicle development. As they do not become mature enough to rupture but form atretic follicles, it may be assumed that this follicular formation is for the purpose of secreting a hormone to maintain the female characters in the somatic cells.

Young pullets that have had the ovaries removed developed into birds that look like cockerels and behave like cockerels. The fact that castration in early life does alter the mental and bodily characters of the individual, yet does not produce insanity, indicates that the changes in the central nervous system in dementia præcox are not dependent upon the regressive atrophy of either the interstitial or the spermatogenic structures, but that dementia præcox and dementia presenilis constitute an innate germinal defect which is manifested obviously in the two tissues of the body essential for the preservation of the species, viz., the brain, the organ of external relation and the reproductive organs.

TABLE I.—DEMENTIA PRÆCOX, TWENTY-SEVEN CASES.

Number of card and name	*Age at death*	*Duration of time in asylum*	*Diagnosis*	*Cause of death*	*Weight of testes in grams*	*Microscopic examination*
1. S.A.L.	25	6 months	Dementia præcox; condition remained with slight change; symptoms of a stuporose, hebephrenic form of dementia præcox; has hallucinations and delusions	Acute pulmonary tuberculosis	10-10	Second stage; no normal Leydig cells with low power, pale syncytium in which are numbers of pale chromatin deficient nuclei of varied size and form, a few small cells with eosin staining; interstitial lipoid much diminished.
2. W.R.M.	19	6 months	Adolescent insanity; made a violent attack upon his mother; irrational, deluded, sullen and depressed; masturbator	Wasting and exhaustion	8-8	Advanced third stage; no normal Leydig cells with low power, pale syncytium with pale chromatin deficient nuclei of varied form and size, fibroblastic overgrowth; interstitial lipoid much diminished
3. A.	21	9 months	Dementia præcox; threatened to kill his sister, suffered from insomnia, delusions, blind, the result of trying to gouge out his eyes; religious mania	Pulmonary tubercle, aortic hypoplasia	10-11	Advanced third stage; no normal Leydig cells with low power, pale syncytium with pale chromatin deficient or diffuse purple nuclei; excess of fibroblasts; early history of symptoms; but inasmuch as the secondary sexual characters were well developed it follows that the Leydig cells have degenerated since puberty
4. M.G.	27	18 months (probable duration of symptoms much longer)	Dementia præcox; history of manicdepressive insanity in father; hallucinations, delusions, katatonic; attempted suicide; admits excessive masturbation	Lobar pneumonia	—	Second stage; not much increase of interstitial tissue, groups of eosin-stained cells seen with low power, but fewer than normal
5. H.W.	21	18 months (for 3 years previously history in the Army of delinquencies)	Recent melancholia; had hallucinations; morose and confused, refuses to speak, with bursts of aggressiveness	Lobar pneumonia	13.8-15.8	Second stage; no Leydig cells seen with low power; isolated small eosin stained cells, pale vacuolated syncytium with oval, irregular pale nuclei deficient in chromatin
6. F.A.E.	28	18 months	Primary dementia, fixed, stupid expression, never speaks unless addressed and then makes silly replies	Dysentery	19-19	Early first stage of regressive spermatogenic atrophy; active spermatogenesis in many tubules, but degeneration of many of the spermatozoa (photomicrographs 1 and 2); diminution of Leydig cells as compared with normal, fewer mature cells (fig. 2, Plate I)
7. L.Wm.	26	20 months	Dementia præcox; dull and apathetic with occasional outbursts of excitement, masturbation	Dysentery and commencing pneumonia (died after a few days' illness)	11-10	Second stage; no normal Leydig cells seen with low power; irregular and oval pale nuclei in vacuolated snycytium pale pink or pigmented; excess of fibroblasts
8. T.	27	22 months	Dementia præcox; "makes grimaces and laughs without cause . . . wanders about gesticulating and doing strange things," has delusions; dull, stupid, no initiative; no note of masturbation	Bronchopneumonia	19-16	First stage; no normal Leydig cells seen with low power; numbers of oval, pale, round or irregular nuclei in a pale unstained syncytium
9. C.U.	24	2 years (about 2 years' duration of definite symptoms)	Dementia præcox; auditory hallucinations; violent at times, otherwise stuporose; no mention of masturbation	Bronchopneumonia	15-16	Third stage; no Leydig cells low power, pale or pigmented syncytium with oval, round imperfectly stained nuclei, fibroblastic overgrowth
10. H.P.	20	2 years (6 months before admission character changed)	Dementia præcox; duration one year, "attributes present state to a row he had with his brother;" was suspicious	Pulmonary tuberculosis	9-9	Third stage; no Leydig cells, high power, occasionally a pinkish vacuolated syncytium of cells with pale oval and irregular-shaped nuclei, fibrous tissue overgrowth
11. S.E.	25	2 years	Dementia præcox; "confused, restless, reacts slowly to questions, deluded, dull, apathetic"	Acute lobar pneumonia (death after a few days' illness)	21.2-16.1	Early second stage; only a few small imperfectly stained groups of Leydig cells seen deficiently stained with eosin; there are numbers of oval, round and irregular-shaped pale nuclei, many fibroblasts; fair amount of interstitial lipoid
12. A.M.	25	2 years	Dementia præcox; dull and confused, indifferent to self and surroundings	Pulmonary tuberculosis	10-10	Advanced second stage; generally diminished interstitial lipoid; dense interstitial tissue fibroblast overgrowth; ill defined pale syncytium with pale nuclei oval or varied in shape and size, deficient chromatin. or diffuse pale purple
13. G.R.D.	22	2½ years	Dementia præcox; dull, stupid, very rarely speaks to anyone, untidy, habits faulty	Acute pulmonary tuberculosis	15-16	Third stage; greatly diminished interstitial lipoid; no normal Leydig cells, vacuolated eosin-stained cells with pale nuclei or vacuolated unstained syncytium with pale, oval irregular nuclei, deficient in chromatin
14 S.T.	27	3 years	Dementia præcox; sullen and very taciturn, laughs silly manner, no cause, very impulsive and at times very violent and destructive	Dysentery	12.5-16	Second stage; atrophy of Leydig cells, many cells pigmented.
15. C.	29	4 years	Dementia præcox; "he takes no notice of his surroundings;" mannerisms, mutism and periods of impulsive excitement at one time associated with cataleptoid state or katatonia; family history *nil*	Phthisis	10-10	Third stage; no normal Leydig cells, occasional small isolated cells seen with low power otherwise vacuolated syncytium with pale oval and irregular nuclei; pigment in vacuolated cells

Number of card and name	*Age at death*	*Duration of time in asylum*	*Diagnosis*	*Cause of death*	*Weight of testes in grams*	*Microscopic examination*
16. M.J.	29	5 years (commenced before 25 for certain; how long before this not known)	Primary dementia of adolescence; hallucinations, delusions, attitudinizing, grimacing and other signs noted.	Acute pulmonary tuberculosis	8.5-9	Third stage; no normal Leydig cells; numerous pigmented cells, pale syncytium with numerous pale nuclei of irregular shape
17 C.F.G.	30	5 years	Paranoidal form of dementia præcox with masturbation, mannerisms, stereotypism; periods of katatonia and excitement	Exhaustion (blue hands and feet at death)	13.5-12	Third stage of regressive atrophy of tubules, no fibroblastic overgrowth; no normal Leydig cells; here and there an islet of Leydig cells seen with oil immersion, cytoplasm pale pink or pigmented; nuclei deficient chromatin, oval or irregular in size and shape
18. B.	26	5 years	Primary dementia of adolescence; no history of masturbation in the notes	Tuberculous broncho-pneumonia, ulceration of intestines	13.5-11.5	Second stage; very little interstitial tissue and lipoid; no normal Leydig cells, pale syncytium with nuclei of varied size and deficient chromatin, a few isolated Leydig cells
19 S.H.	28	7 years (11 months prior to admission gradually became dull, apathetic and anergic)	Dementia præcox; did not brighten up at all; sat or stood for hours in one position, movements grotesque, showed some stereotypy; much addicted to masturbation before and after admission	Pulmonary tuberculosis	—	Third stage; interstitial tissue increased, islands and islets of Leydig cells containing lipoid; Sertoli cells contain abundance of lipoid; no normal Leydig cells but vacuolated syncytium containing nuclei of varied form and size, deficient in chromatin, excess of fibroblasts
20. U.T.	33	7 years	Dementia præcox; dull, listless, only speaks in whispers, occasionally faulty in habits, some katatonia; sits in one place gazing as long as allowed; no masturbation during residence	Chronic dysentery, broncho-pneumonia	8.5-6.5	Third stage; interstitial tissue increased; no normal Leydig cells, vacuolated pale syncytium with here and there groups of pigmented cells; nuclei deficient in chromatin, variable in size and shape; excess of fibroblasts
21 C.W.J.	35	8 years (about 8 yrs'. duration, commenced at 27)	Dementia præcox; history of hallucinations, delusions, masturbation and terminal dementia	Broncho-pneumonia, pulmonary tuberculosis (probably 3 months' duration)	16-15	Early third stage; abundance of interstitial lipoid and in Sertoli cells minute lipoid granules can be seen passing through basement membrane; lipoid granules visible in Leydig cells accounting for vacuolation in hematoxylineosin preparation; no normal clumps of cells; with oil immersion pale vacuolated syncytium with pale nuclei of varied form and size; here and there pigmentation
22. M.Wm.	35	10 years	Dementia præcox; two years after admission notes state that he is suffering with secondary dementia; stands in various attitudes in corners of grounds and wards with bowed head; cannot converse rationally, poor idea of time and place	Dysentery	17.5-4.5	Third stage; all the tubules are deficient in epithelial cells, many are only lined by Sertoli cells; a striking feature is the unequal nuclear staining of the remaining cells in the tubules; the interstitial tissue consists of an overgrowth of fibroblasts and a number of pale nuclei of varied size and shape, around which in places are little collections of pigment indicative of degenerated Leydig cells; no normal cells were observed
23. M.A.G.	27	10 years	At age of 17 certified as mania; year before as suffering with delusions of persecution, possessed by devil, hopelessly lost; attempted to commit suicide; progress of case shows typical dementia præcox	Broncho-pneumonia	20.5-17	Advanced second stage; the most obvious change is an increase of interstitial tissue, excess of fibroblasts; no normal Leydig cells; with oil immersion isolated pale syncytium cells with nuclei deficient in chromatin of varied size and shape, no pigmentation observed.
24. G.A.	36	11 years	Typical dementia præcox of ten years' duration, commenced at 26	Apical tubercle and cholelithiasis	12-0 Left testis absent; left suprarenal 6.5 grm., right 12 grm.	Third stage; increase of interstitial tissue, a few scattered islets of Leydig cells and vacuolated syncytium with pale nuclei of varied form and size, excess of fibroblasts; the spermatogenic cells more profoundly affected than the interstitial cells
25. W.H.	35	14 years	Dementia præcox; "earned his own living until six years ago," four times sentenced to prison; masturbator; had delusions, hallucinations; was irrational, exalted, incoherent, and had innumerable mannerisms; verbigeration; no signs of congenital syphilis	Exhaustion	5-5	Third stage; capsule of testes greatly thickened; seminiferous tubes, extreme regressive atrophy; no lipoid in Sertoli cells; nodules of Leydig cells, many containing lipoid granules; these nodules stained with hematoxylin eosin show a vacuolated syncytium of cells with abundant nuclei of varied form and size containing a fair amount of chromatin, but there is no eosin staining of cytoplasm; the specimen is not unlike that of a cryptorchid
26. D.F.Wm.	33	15 years	Dementia præcox; dull, morose and taciturn; tried to cut his throat; sometimes violent and excited; confirmed masturbator	Adherent lungs, probably tubercular	7.5-9	Early third stage; very little interstitial or intertubular lipoid; no normal Leydig cells seen
27 B.F.	35	15 years (15 years' duration at least)	Katatonic dementia præcox; masturbation and adolescence are given as causes; he suffered with emotional indifference, mutism, katatonia and acrocyanosis; did not obey calls of nature, and required constant supervision; destructive tendencies	Acute broncho-pneumonia	10-10	Advanced second stage of spermatogenic atrophy; no normal Leydig cells seen; syncytium with *very* marked pigmentation everywhere; nuclei varied in size and shape with deficient chromatin excess of fibroblasts; suprarenals very small, deficiency of medullary substance

THE VITAL IMPULSE.

There is an inherent lack of durability or vital energy in the neurones, especially those latest developed ontogenetically and phylogenetically. But this lack of vitality in dementia præcox is probably not confined to these two tissues; being of biogenetic origin it affects sooner or later all the active functioning tissues of the body and there is a corresponding deficiency in oxidation processes.

I do not recollect having seen a case of dementia præcox in a congenital syphilitic, nor have I observed a positive Wassermann reaction in the blood or fluid in cases of dementia præcox, although a great number have been examined. There is no reason why symptoms of dementia præcox should not develop in a case of congenital syphilis. Indeed, I have seen a case of juvenile general paralysis with symptoms of hebephrenia. I have occasionally seen cases of dementia præcox diagnosed general paralysis on account of delusions of grandeur, but they gave negative Wassermann reactions and at death no naked eye or microscopic signs of general paralysis were found. I have not found any evidence to correlate any intimate connection between this disease and syphilis or alcoholism in the parents.

The reason for the absence of acquired syphilis in dementia præcox cases is that the male is not as a rule attracted to the opposite sex, indeed feeling his inadequacy he usually rather shuns and avoids females.

THE SEXUAL FUNCTION AND AUTOINTOXICATION.

It has long been thought, and it has been taught by Kräpelin, Urstein, and other authorities, that an intoxication arising from a disturbance of the normal functions of the sexual glands is an essential pathological condition in dementia præcox. If there be an autointoxication by disorder of the sexual functions is it direct or indirect in its effects upon the functions of the brain?

An excess or deficiency of the sexual hormone may certainly cause a disturbance of the normal biochemical equilibrium of the endocrine gland function, sufficient to make a latent potential psychotic person actively antisocial, and thus reveal the mental disease.

If it be granted that the psychophysical energy of the sex instinct is activated by hormones secreted by the interstitial cells a deficiency would be associated with a depression of psychophysical energy and the mental disorder would be revealed.

Now there is in dementia præcox usually a simultaneous regressive atrophy of both the interstitial cells and the spermatogenic cells of a progressive character; moreover, as a rule, there is a correspondence in the intensity and degree of the atrophy of these two essential structures in the male organ of reprόduction (Table I). It will therefore be interesting to study the male reproductive organs, 1, in extreme old age; 2, in general paralysis of the insane; 3, in postadolescent psychoses; 4, in dementia præcox.

The testes in octogenarians.—I have examined the testes of three octogenarians suffering with senile dementia, aged respectively eighty-one, eighty-three, and eighty-six. In the old man of eighty-one there was active spermatogenesis. The testes were of average normal weight and presented a fairly normal macroscopic appearance; beyond some atrophy of the tubules and thickening of the basement membrane, the tubes and the spermatozoa found in the tubules were for the most part normal as regards the staining reactions. There was certainly, as compared with a young normal adult, a diminished spermatogenic activity and a very considerable diminution in number of the interstitial cells. Small islands and islets of pink eosin stained cells could be discerned with a low power, and examined with an oil immersion these cells presented a fairly normal appearance with the exception that many of them were pigmented (Fig. 9A). The sections presented less evidence of deficiency of functional activity than did the great majority of the cases of dementia præcox, and of several of the cases of presenile atrophy occurring in males at an age between fifty and sixty, who presented signs and symptoms of dementia præcox (Fig. 6C), or in cases of involutional melancholia.

The other two patients, aged eighty-three and eighty-six, showed a much more advanced failure of spermatogenic function, and the tubules exhibited a marked regressive atrophy in many respects corresponding to the third stage of regressive atrophy of dementia præcox. Excepting in the following facts that many of the tubes showed heterotypical mitosis and here and there a few spermatozoa, the chromatin of the nuclei presented a normal staining reaction; here and there small islands of normal stained, but pigmented, Leydig cells could be seen in the interstitial tissue.

The pigment in the cells, it may be presumed, is evidence of senility; but we shall find that in a large proportion of the cases of dementia præcox occurring in young adults dying under the age of thirty and in the presenile cases (Table IV), pigmented cells are present (Fig. 6D), and in one case of dementia præcox in which the patient lived fifteen years after the onset of symptoms the great majority of the interstitial cells that still remained were pigmented (No. 27, Table I).

Having thus established the fact that the hormone cells persist to a very old age, which accords with the known fact of persistent sexual desire, it follows that if in young adults we have a condition in many ways similar to this senile change, it may be regarded as probable that there is a germinal precocious senility, and therefore of formative capacity of the reproductive organs in dementia præcox, which, arising at puberty or early adolescence in the great majority of cases, progresses and finally leads to a complete loss of reproductive power.

The testes in general paralysis.—The average weights of the testes after removal of the epididymis and tunica albuginea of twenty-four cases of general paralysis were 16.5 and 16.9 gm., or together 33.4 gm.

The average weights of the testes after removal of the epididymis and tunica vaginalis in twenty-seven cases of dementia præcox were respectively 12.5 and thirteen gm., together 25.5 gm. (Table I).

The average weight, therefore, of the testes in dementia præcox is nearly eight gm. less than in general paralysis.

Examination of an emulsion of the testis in cases of general paralysis of dark ground illumination in the twenty-four cases, with very few exceptions, showed spermatozoa, whereas in the twenty-seven cases of dementia præcox quite two thirds showed no spermatozoa.

I have examined microscopically the testes in twelve cases of general paralysis unselected. The average age at death in these twelve cases was 49.5. The youngest was twenty-eight and the eldest fifty-eight. The heaviest pair of testes was thirty gm. each (aged forty-six) and the lightest pair was 11.5 gm. and twelve gm. respectively. There were five of the twelve cases which upon microscopic examination showed generalized active spermatogenesis in the tubules and fairly normal interstitial cells and lipoid; the average weight of the pair of testes in these cases was forty-four gm. and the average age at death was thirty-eight. Of the remaining seven of which microscopic examination was made, it was observed that in most cases there was normal active spermatogenesis taking place in some of the tubes, but scattered about in the organ were strands and areas of completely atrophied tubules without cells of Sertoli. Often one testis would show this more markedly than the other, and not infrequently there were naked eye appearances of old inflammatory conditions such as adhesions of the tunica vaginalis and one with melon seeds. These areas of atrophy were either due to a local specific inflammatory condition or probably more often to a gonorrheal epididymitis with secondary atrophy from obstruction of the vasa efferentia. In these latter cases amid the atrophied tubes or more often in the neighborhood were visible under a low power islands and islets of eosin stained Leydig cells.

It may be remarked that in most of the patients, especially those who were over forty years of age, the interstitial cells contained pigment. In only one of these twelve cases could I not see under a low power some evidence of eosin stained clumps of Leydig cells. In most of the cases they were less numerous than in the normal man of a similar age, but this may be due to the fact that in the majority of cases death occurred in or past the prime of life and many had suffered from an intercurrent, often chronic, disease which would tend to exhaust the Leydig cells and arrest spermatogenesis. Yet comparatively to the cases of dementia præcox (Table I) and the postadolescent cases presenile (Tables III and IV) the difference was striking. I have only once found absolutely complete arrest of spermatogenesis in this disease, and that was in a case of prolonged seizures (status), inanition and exhaustion.

Even in testes weighing less than twelve grams, evidence of considerable atrophy, I have found some of the tubules showing active heterotypical mitosis and spermatogenesis. Moreover, the nuclei and the mitotic figures showed a good basophil reaction, contrasting in this respect to the tubules in the earlier stages of dementia præcox where as often as not I found unequal basophil nuclear staining.

The testes in postadolescent psychoses.—In Tables III and IV there are thirteen cases of postadolescent psychoses. If we analyze these tables we see that in a patient with Korsakoff psychosis (No. 5) dying at the age of fifty-five the testes weighed fourteen gm. each; there was a recent arrest of spermatogenesis which I associated with a carcinomatosis of the cirrhotic liver and paracentesis; it will be noted, however, that Leydig cells were visible with a low power, and pigmentation was not observed. The cases of manic depressive insanity, in which there was no terminal dementia, exhibited active spermatogenesis but the interstitial cells were relatively deficient. In the cases where the manic depressive condition terminated in dementia præcox—cases which it may be permissible to call dementia presenilis—occurred, the testes were greatly diminished in weight and exhibited appearances similar to those observed in advanced dementia præcox (Cases, Tables III and IV, and Fig. 6 C).

The investigations are not sufficiently advanced to do more than conjecture that the manic depressive state may possibly be related to the deficiency in the formative activity of the Leydig cells and the influence of such deficiency on the endocrine system.

The close relation of manic depressive insanity to dementia præcox is shown by the fact that it may end in a terminal dementia and the microscopic appearances of regressive atrophy of the testes in such cases resemble those met with in dementia præcox. It would be interesting to examine the brains in these cases, for I expect we should find similar histological changes also.

MORBID CHANGES OF THE TESTES IN DEMENTIA PRÆCOX.

I will now analyze the findings in the twenty-seven cases of dementia præcox contained in Table I. It may be mentioned that in the majority of the cases sections of frozen tissues were stained with scharlach and hematoxylineosin. Lastly, to prevent shrinkage, blocks of the tissues were embedded in celloidin, taken out and allowed to skin over, then placed in chloroform and subsequently embedded in paraffin and cut in serial sections; in this way shrinkage was prevented and the cells were thus prevented from dropping out.

SUMMARY OF THE EXAMINATION OF THE TESTES IN DEMENTIA PRÆCOX.

The results of the microscopic examination of the twenty-seven cases of dementia præcox are summarized in tabular form. In a previous publication in which I devoted special attention to the condition of the spermatic tubules in twenty-three cases, I divided the cases into three classes or stages of regressive atrophy of the spermatogenic cells (Fig. 7 D and E).

In the first stage I included those in which the changes could be discovered by comparison with the normal. Active spermatogenesis could be observed in numbers of tubules, but examination with an oil immersion lens showed that the heads of the spermatozoa were not infrequently of irregular shape, unequal size and staining with eosin instead of the basic dye. There was one case, No. VI (Fig. 4 and Fig. 7B).

(To be concluded.)

A Study of the Unconscious Motivations in Suicides*

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Three great fields are as yet almost untouched as regards the title aspects of our subject: The causes for suicide in children, in the adult deviate, and the insane. We shall confine our clinical study to the two latter. Conscious reasons for suicidal acts have no finality and we get nowhere in endlessly recounting them. However, many conscious formulations have in them vague distortions and projections from the unconscious which make them worthy of notation if not for dependence in suicide motive. Usually the vague insight is not really sufficient to inhibit the morbid act. As we search more deeply into the unconscious motives we find a long existent undue affectability which antedates the suicide moment and the psychosis itself. This excessive affectability is due in part to the type of inherent emotional defect and to the earliest fixations, thus keeping the emotional pattern of such individuals infantile. The nucleus of this emotional defect is shown in that the life trend and desire in the precox patient becomes inverted, having failed to make a healthful externalization in life. In the manic depressive, the life continuity within cracks or snaps, while the same vital energy in the involutional cases seems often to dry up, wither or become benumbed. So we may say that there is not only an undue pressure of external circumstances which unites with allied unconscious forces from within, but that the union of these two factors occurs in an individual predisposed by inheritance and the morbid vicissitudes which entail infantile fixations.

Probably but few subjects have been viewed or written upon from so many angles. The position taken in this thesis is that only by fathoming the unconscious can we get at the true motivation to the suicidal act. Even then the ego concept, the incest and the expiatory causes are but half way studies to infantile fixations. The latter is usually not to be blamed upon the parent or the child. It seems that the primary fault is congenital or hereditary. The emotional fault is worthy of eugenic study.

Before proceeding to analyze a few rather typical cases, an historical consideration of our subject will first be given, with some statistical summaries and conscious precipitants.

HISTORICAL INTRODUCTION.

In classical times suicide was condoned, often commended and idealized and even made the subject of propaganda. There was a school of opposition, but it never went to extremes. As long as it was sweet to die for one's country, or sacrifice one's life that another might live, the antique mind could not be severe on a suicide committed without ignoble motive. There has never been a time, perhaps, when it was thought wrong to court death by exposure to almost certain danger. It is a common belief that actual suicide is coarse work and that it is easy to gain the same result by simply placing oneself in a position of extreme danger and leave the rest to chance. Many of the bravest and most reckless deeds have had a suicide component. But if no sin inheres in thus exposing oneself it is but a sure and short cut to deal the blow oneself. Even among the early Christians when martyrdom was almost the natural goal, there was confusion in this respect; not a few obtained the impression that suicide was merely a form of martyrdom, and "plunged from cliffs in numbers." Only at a much later period did the Church fix the most drastic penalties on suicide; and since vengeance could not be wreaked on the victim it was visited on his corpse, his estate and his kin. This attitude completely did away with physiological or philosophical suicide, and almost for the first time we become aware of the existence of pathological selfdestruction. The statement that medieval suicide was essentially pathological, just as antique suicide was philosophical, seems essentially true, although there are adherents to the belief that the existence of nonpathological suicide has never been proved—could not, in fact, be proved without a due inquest and autopsy. Such a view is expressed by Pfeiffer (1) in his monograph (1912), founded on nearly six hundred autopsies of suicides, very few of whom were free from actual disease, and who mostly presented intracranial lesions. Such a view must involve the belief that a man of sound mind has the instinct of selfpreservation so strongly that selfdestruction is impossible. Shall we ultimately look upon the types of soul conflicts which we shall later present as but finer psychiatric symptoms of morphological change, or are they but incidents of a perversion of brain function which have nothing particularly to do with the various tissue changes? In other words, are they not functional psychoses in name as well as fact?

The increase in suicide has probably been in part motivated by the withdrawal of the drastic penalties of earlier centuries; and this change of attitude came about through legal recognition of the distinction between the responsible and irresponsible suicide with the sentiment that the deceased must often be given the benefit of the doubt. Independent of this factor is another which can only be visualized as the reaction of civilization upon the human nervous system. Before suicide can be committed there must be a severe mental conflict due to the cross pull of the instinct of selfpreservation and the desire for extinction. We speak today of the suicide neurosis, which seems to involve the introduction of vicious circles, and the suicide impulse, which is often the result of a conflict which begets another conflict. At present there may be said to be a socalled statistical party which would base the study of suicide on an analysis of elaborate statistical material, and a party of individualists which regards the deeper motives of the suicide as quite beyond statistics. The latter is the view of the psychoanalytic school. The statistical method is indispensable for correcting the popular misapprehensions. One of these has to do with the inhibiting effects of religion. If a community is genuinely pious and devoted to the dogmas of the Church, such an effect will be evident. Thus we find that in Spain there are fewer suicides than in other European countries. On the other hand France, while nominally a Catholic country, is not religious in the sense that Spain is religious and the suicide percentage is high. We must therefore beware of labels. Another important showing of statistics is the movement cityward from the rural neighborhoods and the fact that in cities the suicide incidence is high and increasing. Clearly if this movement goes on to its utmost the incidence of suicide will show a proportionate increase. Large numbers of suicides are recruited from the ranks of the aged and with improved civilization life is lengthened and there are more and more old men who kill themselves. The influence on suicide of money panics, hard times and unemployment is shown by statistics to be considerable, and this is checked up by a trend in the opposite direction when the financial conditions have undergone adjustment. For every suicide there are a number of unsuccessful attempts—ratios of five to one have been mentioned; while the percentage of threats, compulsive thinking and other gestures in the suicide direction is very high.

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That suicide is one of the outcomes of insanity has always been recognized, although in classical times this type was almost completely submerged by the philosophical suicide. Since insanity is shown by statistics to be on the increase, the number of potential suicides must also increase in proportion. The small number of suicides in interned patients shows that custodial care is a numerical preventive. Seasonal variation is in part associated with the condition of the labor market, but statistics show that contrary to all expectations there are more suicides in the spring and summer than in the fall and winter. The influence of sex has never been great in suicide statistics. One of the most painful revelations of statistics has to do with increase of suicide in the youthful and especially in adolescents.

Stearns (2) analyzed 167 selfinflicted deaths in Massachusetts during a period of five months. In these sixty-five persons were frankly insane, eight were psychoneurotic, six were psychopathic (abnormal personality) and nine were alcohol or drug addicts. In other words eighty-eight or somewhat more than half were presumably mentally unsound (the number due to actual psychosis is usually reckoned at a third of the total). Of the remainder, twenty-five were victims of physical disease, fifteen were put down as delinquents, and nine were senile. In three cases domestic strife was given as the alleged cause, in three loss of employment, and in three death of spouse.

It is evident from a study of this collection that suicide must be studied in groups only. It is popularly held that suicide in the frankly insane, psychoneurotic, criminal, drug addict, invalid, and other affections, can throw no light on suicide in those who apparently are sound and have everything to live for. Some factors cited contain sources of fallacy. While poverty is believed to favor suicide it is not the naturally poor man who destroys himself but the more prosperous man who has become poor or who fancies himself poor—in a word, the one who has been bereft. In regard to race it is commonly said that the Irish are not a suicidal race while the Teutons have a special predilection. But in Massachusetts suicide in the Irish is on the increase while as for the German it is known that he had no special tendency to suicide until the middle of the eighteenth century when some Anglomaniacs appeared to have borrowed the custom from England. This was only a temporary affect and the custom did not reappear until the appearance of Goethe's *Sorrows of Werther*. Goethe has been termed a propagandist for suicide and was forced to defend himself and explain Werther away. Since then, suggestion and example and perhaps the special culture of the race has caused a certain reappearance of philosophical suicide of classical times, which is by no means confined to that country.

In regard to the abnormal conditions including psychoses which underlie suicide, these have in part been quoted from Stearns. Of the sixty-five insane suicides twenty-eight were in the depressive phase of manic depressive insanity and in twenty-one others no finer diagnosis than insanity could be made. Ten presented senile psychosis and the balance were scattered among various psychoses. Esquirol merely employed the word psychosis in the causation of suicide while Morselli, looking deeper, preferred the word degeneracy, which not only made possible the psychoses but the psychoneuroses, psychopathic personalities, alcoholics, criminals, and other conditions, and appears to be an important mass factor. The first to depend on autospy finds was Heller, who has been closely followed by Pfeiffer, who found an astonishing proportion of gross lesions of the brain, with the added possibility of microscopic change in apparently intact brain. Pfeiffer makes three grand divisions, the congenitally unsound, the subject of acquired disease, and the functionally exhausted, the latter including the alcoholic. The percentage which do not fall under one of these heads is small. He quotes Brosch who went at great pains to investigate the antecedents of suicides through family inquests, reading of letters, etc., but this line of research proved so barren and confusing that Pfeiffer (1) says at least an equal degree of importance should be ascribed to the anatomical findings.

There seems to be some connection, at least in Germany and Austria, between suicide and scholars in the intermediate schools. The rate is considerably higher than in either the lower grade schools or universities. The age period affected is fifteen to twenty years which corresponds to the poorly adjusted period of adolescence., These subjects may be considered from the objective or subjective viewpoints. Eulenberg is one who has adhered to this objective statistical method. In but thirty-seven per cent. was a "school motive" elicited, either fear of results of tests or chagrin after failure. (In ten per cent. the students had a psychosis and eighteen per cent. were psychopathic.) In the discussion of school suicide by the Vienna Psychoanalytic Society (3) in 1910 the members showed little consensus as to hidden motive although agreeing that such must be invoked to explain these acts. Rietler

(4) emphasizes a primary fear without object, a "fear of fear." This is apparently related in some way to masturbation. In a subject hitherto innocent, masturbation may be a reaction to this phobic state. If he already masturbates and then breaks off, the neurosis may appear. Fear of examination is merely fear of being put to the test and stands for fear of sexual impotence. In any case suicide and masturbation are subconsciously associated and the latter may in some cases serve as a preventive of the former. Sadger (5) speaks of the rôle of sexual awakening and the resulting shock to the sensibilities as the adolescent learns that the parents discharge animal functions. He craves parental love yet feels disgust with the parents. He may then transfer his affection for the father to the teacher who, like the father, has no psychological insight. Stekel (6) declares that psychoanalysis alone can reveal the hidden motive. He introduces the idea of selfcondemnation in the suicide—the retributive feeling and the desire to punish self. No one could ever hit upon this motive through logical reasoning but it becomes apparent under psychoanalysis. The youth first wishes the death of others—his father, or teacher. Then comes the retributive or expiatory thought. As a side motive is the desire to pain the parents by removing oneself from them. Still another important factor is the part played by the parents in warning and threatening the child in regard to masturbation. He is threatened with all sorts of punishment if caught, is watched and hindered, and finally threatened with all sorts of disease. The notion of retribution and expiation again comes up. The child who has sinned and injured his health must punish himself. Still another component is the attitude of parents that the child must be great and successful. When he realizes that this is not in him there is a distressing enlightenment, and this may be interwoven with failure to pass a grade or enter the higher school. Still another component is found in an incest complex, and Stekel gives numerous case illustrations. In these cases masturbation, incest and suicide seem closely associated. When masturbation symbolizes something good, as it sometimes does, its discontinuance may precipitate suicide.

Sadger (5) cites a case of a man of thirty-two years of heavily tainted stock. He suffered from periodic melancholia with suicidal ideas. Analysis revealed a sexual motive. Cases like this are not the exception but the rule. Even in the psychotic subject there is some definite mechanism. The rich melancholic who claims that he is poor, is poor in love and translates this poverty to his material wealth. If there is no woman in the case the possibility of another object must not be lost sight of. Homosexual inclination does not mean homosexual activities. It may be sublimated in a close friendship or a mere sympathetic attitude with one of his own sex. This is a phenomenon of everyday occurrence, a powerful influence of which sexual perversity is merely an exceptional sequel. The adolescent has a great need of love and the sexual awakening is followed by a stormy reaction. As he learns more and more of life he becomes more and more shocked and frightened. He hates to believe in the sexuality of his parents, even if he has to believe in that of mankind in general. Mostly they feel betrayed and cannot pardon their parents. A coolness develops toward them which is progressive, while at the same time there is great need of parental love. Few parents understand these feelings and look on the children as sort of reasoning idiots. The parents love them and they show no response.

Stekel (6) does not believe in a healthy, philosophical suicide, for who knows what may have taken place behind the curtains in such cases? There is no standard for mental soundness. Eulenburg, Lemaitre, Gaupp, Baer and the other systematic writers on suicide have not solved the riddle of suicide and this can only be done by psychoanalysis, which supplies the motive. Merely to tell us that X, the suicide, was a neurotic, is nothing. It is also a rather cheap way out to say that a suicide was constitutionally inferior. A motive must be sought in the relations of the present day. What, if anything, is common to all of these cases? According to Stelzner the common factor is a contraction of mental capabilities, an inability by means of the will, reason, or imagination to escape from an untenable position. The ideas which might help are not forthcoming. That which the subject would be rid of is the compulsive picture of suicide. The latter idea is strong and the defense fails, whether this consists of resisting or fleeing. As Werther said, "Nature finds no way out of the labyrinth of confused and conflicting thoughts, and the man must die." But why is Nature unable to find a way out? What secret force can be at work at this optimistic period of life which weakens the defense and at the same time locks the doors to escape? To answer this let us begin with the child. The latter overvalues the effect, often so insignificant as to be laughable. But back of this there must lie something more powerful. As far as school life is concerned the analysis of Stekel's cases shows that it is only the eliciting moment. Fear of punishment, defective progress, are not the sole causes. No one kills himself unless he has first wished to kill another or at least has wished someone's death. The child seeks to punish himself, to expiate an offense which he believes he has committed. The analyst sees daily that the criminal intent or desire of a subject demands his punishment. More than the adult the child thinks of death and dreams of it. When his father dies he will marry his mother. When his uncle dies he will get his silver headed cane. Such thoughts beget wishes for death. Punishment awakens hatred and desire for revenge, which cannot be reacted off. Hate thoughts culminate in death wishes, originally expressed but later buried and able to cause neurotic symptoms. It is of daily occurrence for children to wish the death of hated teachers, or at least their illness. The teacher often enough symbolizes the father. When religious feelings appear then begins a conflict. Religion both checks and punishes. The secret court in the child's unconscious mind impresses the idea of an eye for an eye. To wish a person dead is to condemn oneself to death. This is not all, for in inflicting judgment on self one also wishes others punished—parents and teachers alike. The child notes that when it is ill the behavior of the parents changes entirely. It then realizes the esteem in which it is held, and when revenge is uppermost in thought they would seek revenge by robbing their parents of their chiefest treasure.

Suicide is much more common in small families and often it is an only son or daughter who commits the act. The one and two child system favors the development of neuroses. This is perhaps the explanation of the increase in suicide in the young. With few children ambition is greatly stimulated. The parents expect from one child as much as others from a brood. The child must lead its class, be a great artist, or something great. The child dreams of great things. The parents live in a fool's paradise. Then one day the house of cards falls down. The adolescent realizes the impossibility of greatness and is discontented with the mediocre and so arises a new motif to renounce life altogether.

Sadger (5) states that man only takes his life when there is no more love in the world for him. The conception is capable of deepening and broadening. The author cites a girl who was filled with desire to live and to live out her sexual destiny, but who was filled with so many inhibitions that at last death seemed the only way out. She longed for love and feared it in equal measure. Analysis showed that in childhood she had had an incestuous trauma with her brother. Incest and suicide are not infrequently mixed in motives. She loved this brother with her first love and this may have proved a potent inhibition to further love. Further she had masturbated and the suicide idea did not appear until after this period of her life. Onanism is actually a safety valve in these suicidal impulses and unlike normal intercourse did not rouse incest fancies such as were possible to her, but in selfreproach for onanism the incest idea was hidden. When onanism was to be given up the attempt at suicide followed but proved abortive. The brother being her first love, she did not wish to be free from the incest fancy.

Another woman patient of Stekel tried suicide soon after renouncing onanism. The impulse had been getting constantly stronger. For her, onanism symbolized selfdestruction. Autoerotism is sometimes associated with pride at being quite independent of the world. This woman, wife of a physician and autoerotic from childhood, was anesthetic to coitus and continued to masturbate until in reading a medical work from her husband's library she became inexpressibly shocked when enlightened about the habit. Renouncing the latter a neurosis developed with suicide impulses. Suicide was clearly to symbolize one last act of autoerotism. An aged artist also attempted suicide but was prevented by the substitution of bromide for cyanide of potash. He had been practising onanism and his advanced age made this act especially reprehensible to his conscience. He had compulsive ideas, one an echo of a homosexual act in his ninth year, while he also had the memory of an incestuous experience with a sister. These ideas roused him to commit the only sexual act possible to him. He longed both for the homosexual and incestuous which were commingled, and his compulsive idea of a homosexual act was probably a yearning for the sister. There is no mention of remorse or selfaccusation, except for having taken up onanism when past the age for desire. The feeling that he must renounce this symbolic act led to the suicidal attempt.

Stekel reports the case of a stutterer who could stop his defect by placing his hand on his nose. By rubbing his finger up and down the nose he could speak without defect. The boy was a zealous onanist but had a fear of being detected. His father had a dread of onanism and told him to sleep with hands on his counterpane. He practised the act at times with his hand in his pocket, and thought that by keeping one hand in sight on his nose it would dispel suspicion. For a time he had indulged in compulsive lying and once told a long yarn to the physician which was recognized as mendacious. Accused, he said he could not help it, and when under the spell had to lie. He lied to his father when there was nothing to gain. Dismissed from school because of the teacher's illness he told his father the roof was in such shape that it had to be repaired at once. When asked if he was sorry for the teacher he said he had often wished him to be sick, so perhaps he did not like to tell his father the truth; also that he had wished his father to be sick. Another possible reason for lying was the desire to test his father, to find out whether he "knew everything"; for in connection with his habit of onanism he feared that his father might have some secret faculty whereby he could gain insight into his hidden thoughts and acts. The boy had been under treatment for stammering by a specialist who knew the views of Stekel concerning the relationship between onanism and stuttering. This specialist made some fake tests of the reflexes, etc., and then announced point blank to the boy that he was a masturbator. This was the worst course he could have pursued, for the boy at once believed that all the world would now know the truth from the stuttering alone; and this reacted on him severely. He no longer felt that carrying his hand on his nose would save him. One of the results was the compulsive lying. Then came suicidal impulses. The whole started from the sense of guilt in wishing the sickness and death of the father and teacher. To this was added the sense of inability to stop masturbation. The outcome of the case is not stated. In a case of suicide of an eighteen year old boy in a business school the motive was given as an unfortunate love affair. His parents disapproved of his engaging himself. Apparently he recovered from this first wound after long illness and the parents had given their consent to the engagement. In the meantime he had lost all desire for the girl. The reaction of the parents' first refusal had inspired thoughts of revenge. In him there also developed a great sense of inferiority after his recovery which made him regard himself as a socalled dead one in every respect. He experienced an inability to think and believed he would lose his mind. He became much attached to an older sister who sympathized with him and finally wrote a farewell to his parents and committed suicide. His sexual life had been fairly normal. Onanism, however, did not produce the same libido as normal relations and he began to be aware of an incest component. While performing the former once he had the idea of an old woman, and wondered if he could find one to have an affair with. This impersonal old woman suddenly became in fancy his mother and he recalled early incest fancies of the same kind. He began to have dreams of his mother and sister. He was unable to take advantage of his sweetheart because the thought of his sister always came in his mind. He also confessed to pederasty with a younger brother. Still another root was found in the infantile desire to startle his parents which he first developed after an injury to the hand. At a very early age he thought of the effects on his parents of suicide; an example of the inception of so many things in the earliest years. Stekel sees in improper raising the motive of child suicide. Too much tenderness is responsible for incest complexes. Normal libido is burdened with the sense of guilt and so the child loses its libido and with it the desire for life. Education, the school, should protect the child from this fate. The neurotic dies because of the unreality of his thoughts. Some affect receives a morbid overvaluation which causes a renunciation of all that makes like worth living. In building up a harmonious system of life a dysharmonic note should be kept out.

Adler (7) states that statistics cannot throw light on motives. The problem, as in the case of the neuroses, is an individual one. Even if by measures based on statistics it were possible to eliminate suicide, the mechanism would still remain unsolved. The obscurity of motive is founded in the incredible sensitiveness of the suicide. Since suicidal attempts much more often fail than succeed there is plenty of material for analysis.

What kind of people seek death and why do they seek it? Every child grows up playing a double rôle in life, this fact being unknown to him. He leans on others from his sense of weakness and learns attachments to those above him and this inferiority sense gives origin to countless reactions. At the other extreme he wishes independence of others and to lead his own life. He is a subject with all the qualities which go with subordinacy, and at the same time a rebel. In the first association he learns to expect sympathy and praise, and if they are withheld feels deeply hurt. He learns to expect gifts, rewards and the like, and learns to use means which promote results along these lines. His attitude connotes a sense of inferiority and he fears especially that his weakness will be unmasked and hence above all dreads being put to the test. The suicide candidate naturally possesses this makeup to a high degree. He dreads making a decision and he brings nothing to a finish. His individuality is suppressed and his dreams of greatness and success are accompanied by the feeling of unfulfillment. In many gifted neurotics this infantile inferiority sense persists and breeds a violent overcompensation. Demosthenes, the stutterer, becomes a great orator; for the possession of an actual defect enhances the sense of inferiority. The intrapsychic tension which results from the inferiority sense is increased by psychic hermaphroditism. Subjection is symbolized by femininity, and mastery by masculinity. Aggression and activity are masculine. In some subjects the strong sense of inferiority provokes a defensive reaction and not alone in boys for girls show it. One expression of this protest is a desire for death partly because it will give pain to the oppressors. Feeling against the parents may later be transferred to teachers, society and the world with a thirst for revenge. Adler regards early sexuality in all its forms as an expression of protest against inferiority because active sexuality is masculine. Suicide is a way out of inferiority but there are collateral motives which collectively form what the author calls a "suicide constellation." The number of these is apparently large and they are bound up according to the case with incest, onanism, sense of retribution, the author even suggesting that suicide may be an act of lust with pleasure.

Freud (8) speaks of "undeceiving the libido" and mentions the "ego motive"; also of the "action of affects on melancholy." Studies by psychoanalysis have still to throw more light on these subjects. In his text upon mourning and melancholia (9) Freud states that sadism alone can solve the riddle of the inclination to suicide which makes mourning so interesting and dangerous. The original condition from which the impulselife proceeds is a selflove which is manifested in the fear which appears when life is threatened and which is so strong that at first we cannot conceive how this same ego can determine its own destruction. It has long been known that no neurotic ever feels suicidal unless he has first wished the death of others and that in such a case his impulse to murder is turned back upon himself. But the mechanism in such a case is not intelligible. How can such feelings be translated into actions? An analysis of melancholy, however, teaches us that the ego can only destroy itself when it has identified itself with an object which it has hated. This object has become more powerful than the ego. The love for an object cannot be renounced although the object itself no longer exists. The substitute for this object which is the ego as a form of narcissistic thinking becomes an object of hatred which is cursed, belittled and tormented in a sort of sadistic fashion, deriving pleasure out of its own suffering. The selftorture of melancholia has exactly the same interpretation as the compulsion neurosis which has for its expression the gratification of sadistic and hate tendencies which can be turned from an outside object upon the ego. Freud believes that the loss of the object in these cases is transformed into loss of the ego.

CASE NOTES.

One must be keenly aware of the very great liberty taken in presenting a single though most important episode in an individual's life and tearing it from the great context of interrelated warp and woof of his existence. If, however, this fact is kept in mind and as true a picture as possible of the suicidal moment is given, I may venture to offer a few considerations which I trust will make the problem of the psychological mechanism of selfdestruction clearer even though it may not offer a final solution. To conserve time and space the case histories are summarized. Not only are the histories the most accurate obtainable, taken in most instances from the Manhattan State Hospital service, but the material is so large it gives an opportunity to select those suicidal persons who present the many phases of mechanisms common to this tragic life crisis. The study is confined to the functional psychoses of involutional melancholia, manic depressive, and dementia præcox. No specific pattern plan, conscious or unconscious, is expressed in this study even for a specific type of functional psychosis, but I believe work along these and similar lines will in time increase our knowledge of the suicidal act and perhaps lessen its occurrence as well as point the way in general to the underlying fault in the development of the affective life.

CASE I.—F. M., a Russian girl of twenty-eight years, suffering from dementia præcox, hebephrenic type. She is very slight, poorly nourished, and very emaciated. She is a rather shut in type, and for the past two years, since the death of her father, has shown progressive failure in health. She brooded over her condition and would sit for hours with a sad, worried expression and wanted to be left alone. She went to a sanitarium for five months and there spoke of suicide, that there was nothing in life for her and the best thing for her was to end it all. At home she seemed to change in her behavior, became restless and wanted to be always on the go. Her mood changed to elation and overactivity.

On inquiry we find that this girl failed to take advantage of early offers of marriage largely because none of the men came up to her ideals. When she reached the age of twenty-four she was no longer attracted to men, or vice versa; she became more shut in and turned her attention and interest more specifically to her father and his failing finances. She helped him in his shop and was a constant companion to him. This setting was quite satisfactory to her and existed for a year, when he died. This was a great shock, and it seemed to her that he was not really dead, that she might come upon him at every corner. She felt that he was a sort of haunting presence. She often imagined he was in his room and in bed. She had frequent dreams of his return. She states, "If I now do anything wrong I feel that my father knows it." She then adds, "I have changed my ideas about a future life. I used to believe as father did, that there was no hereafter, but he used to tell me to cultivate a religious life and I would be happier, but I never did until lately. I now imagine we live forever. After I missed him so and felt he was very near in spirit I used to hear his voice saying, 'I am coming.' One time I dreamed that my father walked right into the house. Once I heard my father say, 'Join me, but wait; take your time; you have lots of time and you will be much happier if you bide your time.' The voices never said to get out of it all; I just desired to be dead; they never told me to make away with myself. When the voices said, 'Bide your time' I was sad, but when they said I was sure to join him then I felt happy and pleased." Gradually the voices heard by this patient have changed from auditory hallucinations to telepathic messages from the father, and these have gradually faded out into mere thoughts and longings. She says, "As father's presence is becoming more like a dead spirit and I no longer feel his physical presence, my mind is better and I am becoming more reconciled. I am becoming more attached to my brother now; he is much like father and I want to get away from this hospital and help my brother in the shop which he has kept going from father's business. I can be quite a help to him if I am released."

Here we see clearly an incest motive for the suicidal act, an attempt to follow the father into a spiritual union through death. Gradually as the patient becomes improved she is getting the father decently interred and forming a sense of a spiritual contact not so very uncommon or abnormal. No doubt the increased transference to the brother is helping materially. The undue affectability in this girl is shown in that all the family are of a depressed type.

CASE II.—R. H. is a single man, thirty-eight years old, suffering from dementia præcox with paranoid trends. In January, 1920, he became depressed and had bad dreams; he stated that he saw lightning and God told him that he must die because he had committed an awful sin. Previous to this, the latter part of December, he had gone to the home of a certain girl at five o'clock in the morning, cried and told her he was a failure; she finally persuaded him to go home. At that time he told his brother that the girl had forsaken him and was going to marry someone else. He was selfaccusatory, and said he would be ostracised because he was a Socialist. He said he was to be punished by God for his follies, that he was the innocent cause of his grandfather's death, and spoke of the transference of sin; voices at times told him to kill himself. On February 13, 1920, he struck himself on the head with a hammer and fractured his skull. He recovered sufficiently to be discharged from a sanitarium four months later where he was diagnosed as a constitutional inferior with a psychosis of manic depressive type. He then became a salesman and in the free interval was still somewhat depressed. He continued this way until September, 1921, when he told his family the neighbors were after him and that they belonged to the Ku Klux Klan. He was then committed. He showed delusional trends and selfaccusatory ideas. He spoke of a flash of lightning and then a dark blue hue, representing the cemetery, and said he had fractured his skull because of an irresistible force due to some fear that he had "transgressed the law of love" (masturbation). In December, 1921, he approached a bottle labelled poison at the hospital and said he wanted to die because of his innumerable sins against God and man. At a recent interview he broke down and wept when the subject of his mother was brought up, and said she had worried over his condition and had died while he was in the hospital, about a year ago, and he felt responsible for her death.

In an analysis of the suicidal moment we find the matter quite complex; there is a long history showing the patient's inability to finish the puberty period. The immediate factors to the suicidal act was a sense of compulsion from an outside force which we have gotten to know is but a conscious projection of an unconscious demand of the social conscience. After the second breakdown this compulsion and conscience idea constellated itself about the dead mother, whom he heard in dreams and hallucinations. A masturbation-sin complex finally broke through in a thought that an act of self abuse was a profanation of his love for the girl and he went to her home in an attempt to beg her forgiveness. When she did not comprehend and turned him away without trying to comfort him, as the mother might have done in similar circumstances, he became frankly psychotic and to relieve the mental tension and conflict he struck himself with a hammer on the left side of his head. Soon after the suicidal act while in the hospital he had a dream in which he informed the mother that he was soon to be married, whereupon she answered, "Why—didn't you sin?" To which he replied, "Yes; so I won't get married." The suicidal act occurred two years ago. He has now again sufficiently recovered his mental balance to leave the hospital on parole.

It would seem from the foregoing that when this man was forced to an issue of an adult marriage, it brought on an intense mental conflict in which the unconscious prompting was symbolized as an incest attachment to the mother; at the hallucinatory behest of the mother he kills or attempts to kill that part of his libido still attached to his fiancée. This having been accomplished he is at liberty to return to the mother imago without a continued sense of sin against her sole love and attention. There is a series of data of a homosexual character which in its repression seems to have had much to do with the paranoid trends in his present mental status. Much evidence of a primary identification with the mother may be a factor to be reckoned with in the final disposition of the pathological picture of dementia præcox with paranoid trends.

Case III.—E. A. is that of a married man, thirty-eight years of age, suffering from manic depressive insanity, mixed type. He has six children. About two weeks prior to being placed under hospital care he was in bed three days with influenza and on getting up experienced a smothered feeling about the heart. He worried over his physical condition, appeared dull, downhearted and agitated and thought he was going to die. He had himself voluntarily committed as he had an impulse to kill his wife and children. There soon developed delusions that the patients in the ward were going to kill him. He had ideas of selfcondemnation and spoke about an affair he had had with a woman five years ago which he had concealed from his wife. He began to hear voices telling him his wife was dead and he also was dead but would come back to life and was going to be rich and have all the luxuries that had been denied him. The following is given by the patient:

"Everything seemed dark and dismal and I had a heavy feeling on me. I didn't seem to care about anything. I had no ambition. I was afraid to eat because I had gas on my heart and felt as though I were smothering. Then I had strange ideas that I was going to hurt my family. I had a fear about the episodes with the woman five years ago, that my wife knew about it and would not forgive me. Then I thought I was a devil and that I had to die. After I was married I went to see my mother regularly. My wife was a little jealous of her at one time and they had a little argument and did not speak. Once I was ill, and my wife threw some medicine I had bought away and told me to go and stay with my mother. Since then there has been no phase of my mother coming between me and my wife. When my mother heard about my affair with this other woman she said I should be ashamed of myself (patient breaks down and weeps). My wife had an idea about it but was not quite sure. I denied it to my mother and didn't tell her the truth. When I felt so miserable I had a dislike for my children. When I married I changed to the Catholic religion. My family are Episcopalians. I felt I wanted to be buried with my wife and children. Before I came to the hospital I confessed to the priest; I told him I felt I was going to die and wanted to confess, and he prayed for me and gave me absolution, but I did not feel really satisfied. I started to pray to God that I was a sinner and to forgive me. I had a visit from my wife and she told me that whatever I had done in the past she would forgive and stick by me. I felt good after that. I felt I wanted to explain to her, and now I feel that God has begun to hear my prayers and will give me release. However, I cannot feel yet that God has completely forgiven me."

Here we have a man who apparently was never very frank about his sexual life. Even when questioned why he was detained at the State hospital he gave a long account of his indigestion, headaches, and physical breakdown and only became openly frank when the mental conflict was personally inquired into. He was able to repress the unfaithfulness to the wife fairly successfully. However, the sense of guilt began to show in conversion symptoms and finally at his wife's jeering comment that he did not dare to go to a hospital he went of his own accord to the police station and asked for an ambulance to take him to Bellevue Hospital, showing here a double motive of disease and guilt in the act. Only when he reached the psychopathic ward did his psychosis become fully florid. In the whole picture one sees the unconscious annihilation of his family and a desire to return to the mother. Back of the incest there appears to be an expiatory mechanism for early onanism, etc.

Case IV.—M. L. is that of a married woman, aged forty, of German descent, suffering from an attack of manic depressive psychoses. She was married fifteen years ago, has two children, and although her married life was not unhappy, misunderstandings between herself and her husband were hard for her to bear. Three years ago she began to complain that her husband was not making enough money and tried to advise him to do other things. Shortly afterward she had an attack of influenza which was quite mild but nevertheless she thought she would not get well. She became depressed and was taken to a hospital where she recovered. Soon she began to complain of pains in the stomach, became nervous and excited. Her husband states that on this occasion he scolded her. As a result she was discovered in a room with the gas turned on. Since then she has had auditory and visual hallucinations. She says, "I see such terrible things—a policeman came and took my children. I can hear my relations talking to me and they use such rough language." The patient states that she began to brood a great deal, thinking her husband did not appreciate her. Since January, 1919, she began to have attacks of violent fear and anxiety, to which she attached the content that she was going to die, that some calamity was going to happen, that she would go insane. She also got the compulsory idea that she would have to kill herself and children and felt impelled by some force to do so. She had visions of her husband and children and heard them speak. She tried various means of suicide in the hospital, the last being to tie a string about her neck.

Here we find the patient, though not seemingly greatly attached to the father in a conscious sense, yet in her suicidal attempts the father beckoned her to come to him. In many conversations God and the real father are interchanged. As a preparation to the suicidal moment we find that the patient grew sad and dejected, refused relations with her husband, went out to work for herself and finally attempted suicide repeatedly. Just before the first suicidal attempt she had a vision of the Book of Life in which her name was written; God then appeared to her and said, "Are you ready to die?" to which she made no reply. God then rejoined, "You must suffer much before you can come to Me." The sins, though vague, had to do with unfaithfulness to herself in that she had made a loveless marriage and had therefore been untrue to God when she had professed love for her husband which at the time and since she did not feel. She therefore believes she must repeatedly try suicide until successful but that she will not be successful until she has suffered enough to expiate this sin. She continues very alertly suicidal and the mental conflict seems not to be much relieved either by talks or diversified occupations. The patient has been incarcerated for the past two and a half years with no obvious improvement.

GENERAL CONCLUSIONS.

In a psychiatric setting one almost invariably finds an onanistic, an incest, or an inversion motive at the bottom of the suicidal impulse. The dynamic element is for the patient to solve his conflict by repressing it; during this process the psychic tension increases and many formulations of the repressed affects expose themselves in the psychoses, directly and plainly as such, or in symbolized categories of hallucinations and delusions. Why are the perverted and inverted fancies operative in these individuals and not in others? Undoubtedly the concatenations of circumstances entail not a few failures of the normal repressing mechanism and thus liberate the florid aspects of the particular type of psychosis; but this alone is not sufficient to explain the basic psychosis, much less the particular extra tension of the suicidal moment. What, then, does? All potential suicides usually voluntarily detail their natural undue affectability. This is possibly inherent, and common in the family stock; it may be an hereditary taint, or it may be summated in the essential infantility of the emotions due, no doubt, to the earliest fixations to one or the other parent. Nor may one solely indict the incautious fostering of infantile love on the part of the parent. Perhaps in most instances the parents have had nothing consciously to do with it. Many are likely to blame the particular person for not having himself broken the family tie; but this again is not fair, neither in the making of the fixation nor its riddance. We can easily see that though it were once perhaps a conscious selective attachment, in the great majority it would almost seem that it had never fully entered consciousness and is only capable of working its disastrous result by remaining unconscious throughout. To become partly conscious is to lose its power to produce the psychotic picture.

Experienced psychiatrists have long known that in the chronic insane suddenly encountering a physical mishap attended by severe wound such as fracture of bone or extensive laceration and contusion of soft tissue, that the patient may rapidly recover from the psychosis previously considered hopeless. Many documented cases of such a miraculous result have been put on record and explained for the most part by the adventitious physical shock which in some still unexplained way restores the normal mental tone. May not this specie of shock have a psychological interpretation not necessarily due to a chain of morphological alterations in the tissues? What may one say of many a functional psychosis, especially retarded depressants who, long contemplating selfdestruction, suddenly attempt it in a moment of greatly increased psychic tension? In many such the attempt is unsuccessful and almost immediately the psychosis mends. If we believe that the psychosis as shown in many instances here and elsewhere is essentially an ethical or religious formulation especially in expiational cases and the resulting sorely tried conscience seems naturally or mythically to demand a release of the mental tension by suicide, may not a sincere gesture to this end fully release the conflict and thus permit the person to recover a normal state? Some instances of this sort have been cited. For the sake of argument may we not believe that they have sinned against themselves or others or against some supernatural being and this soul debt, as it were, is requited if they sincerely attempt to pay with their life? It may be gruesomely suggested that in such instances one may more or less willingly permit the person to attempt suicide but rescue him as soon as his gesture of an intended life forfeit has been made. We are more inclined, however, to believe that such a procedure is on the whole a crude system of mental therapeutics comparable to final or desperate surgery. The commoner methods to aid depressive and anxiety psychotic patients are too well known to take time and space to enumerate.

May we not, however, take on new zeal in simple talks to many suicidal patients and help to lessen the intrapsychic tension by such manner of approach that shall be acceptable to the individual and his special type of conflict? We know that a mere senseless recounting of their stories of misery and misspent opportunity is of little use. For them the day of simple confession is past, and something more efficacious is needed. Thus transference or intensive personal influence may succeed in resynthesizing the soul unity of the desperate and despairing patient. This aid may be by a skilled physician, a wise clergyman, or simply a comforting nurse. The latter is more frequently the healing agent than many of us are apt to think. A sincere friendly hand often not otherwise skilled is the great need in many instances. When may we hope that the clergy occupying such a unique vantage point in mental healing shall be psychiatrically trained or at least made aware of some of the more obvious truths of mental disorders and methods for their alleviation?

What is the fundamental defect in the libido organ giving rise to these various psychoses? As might be expected, it is best studied in individuals before any psychotic weakness is in evidence. In other words, it is innate in every neurotic and psychotic constitution and most likely will ultimately be found to be best studied as family stock defects. But at present neurotic and psychotic trends have not been studied beyond the particular individual exhibiting the actual breakdown. When we go back a little to the unconscious motivations for selfdestruction in psychotics one is impressed that sooner or later it is found that the pith of the mental conflict is really a moral disorder, a religious or ethical conflict. At first it may be hard for one to entirely discard his own ethical views of life to properly evaluate the suicide's problem and this attitude has no doubt been much to blame for our overemphasis of the negative motivation of the specific act of selfdestruction—such as a tedium vitæ, financial or moral wreckage.

It is quite true that such motives are most frequently kept prominently in the foreground but the causation of suicide in order to be fully understood must be positive, dynamic and really unconscious. One must be able to place oneself in the position of the suicidal person, accept his ethical views and ask oneself what positive satisfaction can this urge or suicidal act give to the person undertaking this end? In other words, what are the ultimate soul satisfactions in this solution of a life conflict? Many ask: what about the sane suicides; do they not have an entirely different psychology? In the first place one must say there are probably good instances of sane selfdestruction but not normal selfdestruction, i. e., if one believes that the fundamental normal desire is for an enduring continuity of the life process. Do, then, the sane suicides have the same psychology as the psychotics? Apparently they do, though the full and unconscious motivation to the act may not be analyzed so specifically. One may say the act is raised to such a state of perfected rationalization that it may elude our still crude methods of character analysis. However, it is possible for us to study more and more carefully the mild states of mental alteration and deviation from the normal. Sooner or later the situation shifts from a purely medical pathology to mass or social psychology and mechanisms strictly of use in the psychoses lose their utility for such a study. On this large uncharted sea of socalled normal deviation in human behavior, our present restricted handling of the individual pathology is found to be inadequate and almost useless.

Not only are schematic syndromes or action patterns, deviation of behavior and beliefs insufficient, but one needs more knowledge of normal life analysis, some delineation of the keen insight of practical philosophers. One might pertinently ask, what do men live and die for? The clever analytical novelist tells us something, but we need more than this; we need a large knowledge of different forms of life patterns and their modifiers. For simple illustration, who can accurately describe the mental healing process in a fairly normal individual who has lost a much loved relative; again, to what extent does the suddenness of the loss injure the libido organ and what are the latent powers of an individual to synthesize and reabsorb the fractured or split off states in the unconscious libido? What power has the phyletic past in the soul development to help the particular individual to resynthesize his soul energies? What ethical views of his past and future may be laid under contribution to aid the stricken person to regain his soul balance? May we say that the majority of us live by illusions, as Stuart Mills contended, and that our very contentment to give over querying Fate too earnestly keeps us sane and willing to live so long as we may? Here and there in perhaps too introspective moments man may see clearly his fruitless effort to subdue reality, and such inevitable moments may sweep the emotionally unstable from a sound life mooring. It may be that the libido striving for continuance may vary in individuals or different races. Already many question that the same unconscious degree of striving is present in the psychopath as in the normal. Why, then, is the fluctuation in the rise and fall in the tide of joy for living so great at times as to leave whole numbers of individuals and races stranded with a negligent disregard for continuance? Stekel maintains that man is often obsessed with death and seeks the slightest excuse to risk his life on a hazard. For that matter who has not been strangely moved by witnessing the aviator's darings and his siren call of having a rendezvous with death? From such and many other speculations one is aware that while individual studies of special mental cases in asylums may throw a flood of light on special aspects of the motivations in suicide, we can easily recognize that only a broader pathology of all life, normal and abnormal, can make clearer the socalled sane suicide's real dilemma.

What, therefore, are the determining factors in the suicidal act? 1. There must be a great disturbance of the normal balance of desire to live. This may or may not formulate itself as a distinct psychosis—a psychosis is the more formal and common setting. 2. There is in this regression or withdrawal from a normal adaptation to reality an increase of intrapsychic tension—this tension, formed from the conscious and unconscious conflicts, usually resolves itself into what is properly called a sin either of commission or omission. 3. If the infantile unconscious demand is sufficiently strong and the mental regression goes deep enough we obtain the fundamental solution in selfdestruction, not because in the last analysis the person really chooses this end consciously, but because the dynamic fixation of infantile attachment decides it. This is usually formulated directly as the call of the parent or loved one, or by the still more insistent demand of a Supreme Being. Psychologically one easily discerns in the beckoning or call of the latter, that of the all compelling parent.

It is quite evident from this and similar studies that there is at all times and under all circumstances an insistent demand for a properly integrated soul unity and an acceptable synthesis of the ego part of the personality. Some persons are able more or less acceptably to withstand temporary disintegration of this organ of the mind and gradually reacquire a soul rapport; in others it is not possible, and in such our studies begin. It would seem the soul reaches out in attempts to suicide or death to resynthesize this love rapport. If this need of the soul finds no safe lodgment in a spiritual or philosophical sublimation, the living remnant of the libido organ which still remains attached to reality may be destroyed to free the spirit for a hoped for reunion. Perhaps the gesture of suicide has a strange psychological irony in that it really does not seek the loved object *per se,* but that part of it, or those supposed attributes, which the soul has given of itself to the loved object. In other words, it but seeks the attributes which once reposed in a nuclear form within its own love idealism (narcism) and which the soul, as it were, but lent or gave to the loved object of which it is bereft. A resynthesis of the soul of the potential suicide is often more expeditiously possible the more patent it becomes that the gift were but a loan, to be returned again to the ego that it may become reattached to other love objects.

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Psychopathological Disturbances from the Avoidance of Parental Responsibility

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Anton Chekhov (1), the Russian physician and author, has told us that "an artist's instinct may sometimes be worth the brains of a scientist, that both have the same purpose, the same nature, and that perhaps in time, as their methods become perfect, they are destined to become one vast prodigious force which now it is difficult to imagine . . ." Chekhov knew, for he was both artist and scientist. In him the two were blended. In many instances we have seen science foreshadowed in works of phantasy with an accuracy that is incredible.

The proper adjustment of the relationship between parent and offspring has been a perplexing problem for ages. In the human family the situation is infinitely more complex than among the lower animals and with the increased intricacies of our civilization the problem has become vastly more involved and we rarely consider the conditions as they really are. Among primitive peoples there were fewer repressions and more active laws; more mystic rites, and more stringent taboos were invoked in an attempt to solve familial relationships. It is therefore, a matter of little wonder that the question is rarely openly faced or discussed. However, we see many unconscious attempts to consider this, as a problem, in works of literature and in the drama. Remarkable as the coincidence may seem in four recent plays, one of their major themes was the problem of the avoidance of parental responsibility.

From a casual survey these four plays, *Liliom, Mary Rose, The Bill of Divorcement,* and *Anna Christie,* seem to have little to do with the subject. Let us not be too hasty, however, but pause for a moment to study the situation more carefully.

MARY ROSE.

This whimsical play by Barrie (2) is replete with symbolic situations and material. Mary Rose, the heroine, had had a psychic episode during her adolescent period, when she disappeared for thirty days, a period which we may approximate to her menstrual cycle. This episode took place on a mysterious island "that liked to be visited" while she was with her father. While he was fishing (catching fish—being productive) she was painting (being narcistic. When he returned to the spot where he had left her she was not to be found. Finally, at the end of the thirty day period, she reappeared. Her period of absence may be called her retreat. She had fled from the responsibilities of adulthood, of productivity, when Nature showed the signal of her adolescence, menstruation. For the period of her retreat there was an amnesia and her parents were very careful to *avoid speaking to her of this episode* which, to them, always appeared as something uncanny, mysterious. Some years later when her suitor asked her parents for her hand in marriage they told him, in great secrecy, of the incident; they warned him. He was never to remind the girl of the incident for fear something similar should recur.

The young man being a sailor and brave and in love, listened to the story, but nevertheless married the girl. In the course of time a son was born to the couple. After the birth of the boy who was not wanted by the mother (as shown by the incident of her hurling a butter dish at her husband when she discovered her pregnancy) the couple revisited the mysterious isle where she had disappeared at the time of her puberty. Her attitude toward her son is shown by her saying that the happiest moment in her life will be when she is able to sit in his lap and have him hold her; in other words, when he is mature and can assume the lover rôle.

During this visit she again disappears and remains away for a number of years, until her period of reproductivity is over. She had again gone into a retreat only to return when her son was grown. We need not consider, for the purposes of this paper, the many interesting ramifications of the play aside from the one of the mother's retreat from the responsibility of bringing up her son and remaining in contact with him during the formative or adolescent period. She returned when she could meet him as a grown man—a man who had solved his problems of life and sexuality without her aid or guidance. When she emerged from her second retreat she was again unconscious of that part of her life during which she had retreated and when she returned she appeared as young as when she had disappeared.

THE BILL OF DIVORCEMENT.

This play (3), which also originated in England, deals with a postwar situation based on the right of divorce in cases where mental illness occurs. The time of action is projected into the not too remote future and we have an attempted presentation of how people would conduct themselves a decade from now. It was a war marriage and the husband soldier was supposedly shellshocked. The wife and daughter, who are of the ultramodern variety, carry on with their living and loving and each becomes engaged. The scene is laid at about the time of the daughter's maturity. A divorce has been granted to the mother. Suddenly the father appears on the scene; he has apparently been cured. In other words he has come out from his psychic retreat, at the time his daughter has reached adulthood. No reason is given for the mental derangement which occurred, so we now assume that the knowledge of the birth of the daughter had something to do with it. An added responsibility, let us say a responsibility he could not face and therefore he retreated before it—went into his psychosis. When the responsibility of that period of parenthood which would bring him in contact with the maturing child was safely over, he reappeared or emerged from his withdrawal.

ANNA CHRISTIE.

This powerful play (4) is the only one of the four chosen as examples which was written by an American, Eugene O'Neill. Here we are presented with a reconciliation between a father and an adult daughter whom he had not seen since her birth. He was a seafaring man who had a constant grudge against "that old devil sea," yet he was constantly running away from his wife and family to this same sea. Undoubtedly the sea had a double affective value for him and it acted as a refuge for him when he had a problem he could not face. Here the sea was as a mother to him. When in trouble he would go to the bosom of the sea to secure solace. Yet he hated the sea for the pull it had for him. This is so frequently the attitude one finds toward the mother in men's lives and in the record of man's life—anthropology. We find the mother portrayed as ambivalent—the good kind mother and the terrible mother. Jung (5) stresses this point in his study of the unconscious. The sailor's daughter was sent to relatives on a farm in Wisconsin when her mother died in Sweden, so she could be brought up inland, away from "that old devil sea." She was sent where her father would not be obliged to look after her during her adolescent period. Now that she had grown to womanhood her father had made plans to see her. She finally takes the initiative and comes to New York to see her father. Her father learns that she was so securely sheltered "inland" that she had become a prostitute in order to escape from the sheltered drudgery and monotony of her loveless life "inland." Again the father seeks to escape from reality, the product of his neglect. He first tries alcohol, but Morpheus visits him fitfully and the retreat in this direction is incomplete. He needs more solace—again he seeks the aid of that great mother sea. He signs up for a long cruise, so he may avoid facing the failure caused by the avoidance of parental responsibility.

LILIOM.

Liliom (6) comes to us from the Hungarian. In it we find a rare blending of phantasy and reality. In a former (7) and more complete analysis of this play I did not stress the problem of the avoidance of parental responsibility during the adolescent period which the play portrayed, for at the time of writing the original analysis I had the idea of utilizing this phase of the problem in the present paper. The story runs that Liliom, a shiftless character, with an infantile sadomasochistic makeup married Julie, a patient masochistic servant girl. She becomes pregnant and Liliom, who has lost his job as a barker and bouncer on a merry-go-round, is confronted with the responsibility of caring for a family. Winter is approaching. Liliom goes into a profound psychological retreat which may be interpreted as a dream state or a psychosis when he learns of the impending event. The phantasy portion of the play then takes Liliom from one conflict and frustration to another. Each time he seeks more profound retreats. In his quest for financial security he hazards many opportunities which always leap beyond his grasp. When confronted with the consequences of his struggle with society, he succumbs. He suicides, but this is not final, for he is brought before the police magistrate of heaven. Here he thinks he will at last find rest. But he is sentenced to burn for sixteen years as a punishment. He is told in this makebelieve heaven that *when his daughter is grown he may return to earth to do a good deed for her.*

From the time Liliom discovers that he is to be a father he runs away from the responsibility of the bringing up of the offspring. It is to be admitted that he first seeks to find a way out. He tries to formulate a plan whereby he can make much money so that he may face the responsibility but he does not try to do this through legitimate channels. He refuses to work. He does not feel that he can compete in the struggle for existence in a conventional manner with the tools with which he is equipped. His is a psychotic personality. He realizes his inferiorities and seeks to avoid a normal battle for a position in life. We have considered his attempted escape from the physical struggle but we have not mentioned the psychic struggle of how he was in reality fleeing from the new relationship which the coming of a child would entail.

Finally at the end of his sixteen year sojourn in a region of high thermal registration he is allowed to come to earth to visit his daughter who has grown to womanhood. It must be remembered that all of this part of the play, which deals with Liliom's activity after the news of the impending birth, is phantasy and this phantasy really occurs in the mind of Liliom. We may, therefore, look upon these episodes in the same way we would upon a dream. It contains his *wish* that he escape from his problems, after he has convinced himself that he can not solve them, and he also *wishes* to visit his daughter after she has reached maturity.

Is it also his *wish,* we may ask, to burn for sixteen years? Yes, for it is a selfpunishment, his guilt at not facing the situation, for his wish to punish others to whom he attributes his failure. It is his hate mechanism turning back upon himself. This question of why a person of the low infantile psychic level of Liliom should have a conscience which would inflict selftorture in this fashion, is not an easy one to answer. Yet we never find sadism, the desire to inflict punishment, without a compensating masochism or a desire to be punished. This is always revealed in the emotional life of our patients. The feeling of guilt is the most common one among the neurotics. These are the conflicts, the compensatory laws of the mind, and these conflicts result in the neuroses and if the retreat reaches the lower levels, the psychoses.

EVOLUTION OF THE FAMILY.

As man has become more complex anatomically and psychically a longer period has been required for the organism to remain dependent upon the ancestors for nourishment, protection, and guidance. In many of the lower forms of animal life with the laying of the egg, in some secure spot, the duty of parent to offspring is completed. The offspring is frequently born without any contact with its forebears, yet equipped with instincts, or more properly inherited memory patterns which enable it to lead a highly specialized life including the intricate business of providing its own fodder, sexual union, and leaving the unbroken chain of its species in a fertile egg which it in turn deposits and protects. At times nourishment is secured and stored with the egg where the newly hatched insect may easily secure it when it emerges from its resting stage. As evolution takes us through the higher forms of fauna we find the dependence of the offspring entails a longer and more intimate relationship with the parent. The period of intrauterine life is gradually lengthened to allow for the development of more highly integrated mechanisms. The more highly developed, the more helpless the offspring at birth, the more time required for the completion of the organism to a point of independence. As the infant requires protection from its elders, so do the elders require protection from the community, for evolution has also evolved a civilization with its diverse complexities which has sharpened the struggle in many ways and ameliorated it in others.

In considering even a partial relationship between parent and offering, we must not neglect to take note of former familial relationships even in remote antiquity; how familial relationships are handled today; what the defects are in the relationship as they generally occur; and why these defects exist, for there must be a cause which has a protective as well as an incidental injurious consequence, and finally how these defects may be overcome. This I admit is a large task and at the same time an important one.

THE HERD AND THE FAMILY.

Man's relationship to the herd in a large degree determines his relationship to the offspring. He instinctively (unconsciously) records the attitudes of other families and in a general way imitates the others. The examples he finds in the other family groups are mostly the mediocre adjustments. This results in a faulty training and environment for the child who in turn is handicapped when called upon to face the responsibilities of parenthood.

This brings up the effect of the adjustment which the parents in their turn had been obliged to make with their parents. If little information was received on certain subjects there will be little to be handed on to the child. There are, fortunately, examples of evolutionary growth and a realization that all is not as it should have been.

SEXUAL REPRESSION.

Culture as accepted in a broad sense and not restricted to the accepted ultrarefinements, has caused many primitive and innate feelings to be buried in the background. The question of sex and the closely allied ones of marriage and the family have not been frankly faced. The discussion of things sexual was crowded back and they were labelled as dirty. This suppression has in turn caused them to fill the unconscious mind and to emerge again in many disguises. This is only one of the reasons why a thorough exploration of the unconscious reveals so much sexual material. For this reason certain so-called psychiatrists feel that we should leave well enough alone and not disturb the resting place of this buried "filth."

The growing child in its pregenital age is slowly integrating many erotic sensations into a more centralized genital zone. During this growth many cravings come to the fore and in turn each is shunted off into more or less unhealthy channels. There is seldom any intelligent discussion or instruction for the child. Nature striving to be creative causes powerful cravings, yet there is no outlet and no understanding. As we examine the present day attitude of our higher civilization, as compared to that of more primitive peoples, we find more and more suppression. As in the case of the other problems in the relationship between parent and offspring—only more markedly so—the parent is unable to present even the limited knowledge at hand to the child. For this inability we must also have an explanation. The explanation of this problem will shed light on many other difficulties in the relationship between parent and child.

In order to understand the attitude of the parent we must consider briefly the entire life cycle of the individual. The parent during childhood was obliged to grope through the complexities of the various states of sexuality unaided. Many obstacles were encountered, many painful experiences undergone, and for the most part these were buried deeply in the unconscious. False information heightened the feeling of guilt. Sex, instead of being brought to light and made a thing beautiful and constructive, was by common consent hidden in dark recesses, dwarfed, stunted and deformed. For this no blame can be placed on the parent, for it was the custom and the result of culture. This, too, had its purposes. For many reasons it was difficult to face sex, and it had to be relegated to the dark, to be handled by each member of society in the best, or more accurately, the worst way possible. How can we blame anyone for this attitude when we see men of "science" stating that masturbation causes illness, insanity, etc.

So the stumbling child, with its feelings of guilt for its transgressions, both real and imaginary, such as masturbation and many fantasies connected with sexual matters, grew to adulthood and the sexual question could not be faced squarely. How could this parent be expected to give information to the child? But there is another, a more fundamental reason for this inability to come into contact with the child. We will take this up in our consideration of what is called identification.

IDENTIFICATION.

With the coming of a child there occurs what is technically called identification. That is, the parent, in varying degrees, identifies itself with the child and endeavors to live again those days of childhood unmarred by care and responsibility. With the new responsibility of guiding and protecting a new soul, what should be more natural than an effort to unconsciously be a child with the child? This process of identification may be of a fleeting or momentous character. The mother or father entering into the play of a child for that moment is a child again. Instances where lapses into "baby talk" by adults who have been associating with children are common. This is only an outward symbol of the more profound internal identification which takes place.

The process of identification brings with it not only the joys of childhood but also its trials and pains, those connected with the unaided struggle with sex and all manner of tabooed topics being the most difficult to manage. These painful episodes have been suppressed for the most part—tucked away into the protective folds of the unconscious, from which they emerge to consciousness disguised in the cloaks of symbolic masquerade. So we have with the identification or an effort to taste again the joys of childhood and an effort to escape from the bitter recollections. Those topics and episodes which were most painful we do not recall. Therefore the common reluctance on the part of most parents to avoid the important discussion of sexual topics with their children. The degree of pain initially experienced on the one hand and the ability of the person to overcome these painful affects on the other can be measured by the parent's ability to discuss forbidden topics with their children.

We see parents who are unable to discuss anything with their children on account of a strong emotional affect. In these instances the relationship between parent and child which arises from the forbidden sexual topic is transferred to all other subjects which may come up between them. The result is a state of friction or a flight from the situation. The child is sent away to a boarding school or constant misunderstandings occur between parent and child and in the all important sphere of sex the child grows up alone. There are, to be true, many other causes for a lack of understanding and we are not justified in assigning all difficulties to this one cause. There are many instances where the parent unconsciously wishes to dominate the child and naturally the child seeks to escape from this position of servitude and blindly strives to break the bonds. This attempt to dominate entails the identification of the parent with the offspring and is an effort to fulfill the life the parent should have liked to consummate in the life of the child.

UNCONSCIOUS MEMORY.

Creative evolution has shown that acquired characteristics are slowly assimilated in the racial unconscious, the archaic unconscious, or unconscious memory as it is variously called. In this manner we account for many functional as well as anatomical characteristics.

Unconscious racial memory has played its rôle in relation to incest. Today it is rare to find the subject of incest referred to in the family discussions, yet the incestuous cravings which arise are not on the surface, that is not in consciousness, except in certain instances of severe mental disorder. Yet in the unconscious as revealed in the dream and more openly in the psychotic we constantly encounter various transgressions of this character. How, then, can we account for a repression of this type where the wish is repressed before it ever emerges to consciousness? In just the same way we account for the instinctive act of a spider or a wasp. The unconscious memory has assimilated the taboo in one instance and the pattern of the various acts of insect life in the other. The avoidance of incest may be classed as a protective mechanism just as many of the unconscious protective activities of animals. We can then give an adequate explanation for the attitude of man in regard to the avoidance of incest without any special training which may be received during life. We are not obliged to attribute it to a moral goodness or to some divine act, no more than we are obliged to attribute to these sources the intricate functional behavior of insects who go through a life cycle of highly specialized acts without training. The insect knows exactly what to do at a given moment. Every act is done with precision and skill. Food is gotten from the most advantageous sources.

Take the life of common spiders so graphically described by the brilliant French naturalist, Fabre. The young spider emerges into the world from an intricately built and carefully prepared nest with a large group of brothers and sisters. Cramped from its long sojourn in the chamber from which it hatched from the egg it spreads its tiny legs and suns itself. Then this concentrated minute bundle of energy spins a delicate thread which is caught by gusts of air and enables it to attach itself to a point of vantage. After a short period of rest it begins to make its web and then to set up its own home and independent existence. It captures its prey—killing in a most scientific manner—or in some instances paralyzing its victims so it can better feed on the circulating fluids in the body. Mating is accomplished, and in a methodical fashion, and then the future generation are provided for by the laying of the eggs in a marvelous receptacle, a many partitioned and weatherproofed ball of silk. Great skill is shown in the weaving of the web which is a feat of engineering unsurpassed by the most highly trained human workman. Each thread is so spun as to ensure elasticity allowing for wind, moisture, dryness, and thermal changes. So it is with the silk ball which shelters the eggs. There is a maximum of protection and practically every contingency is provided for. With all this complex life there has been no instruction, no example shown by the elders who have perished or any chance to learn from its contemporaries, who have scattered to remote distances.

This study could be continued to the intricacies of the social life of the hive or extended to include the behavior of many other forms in the insect world, beetles, wasps, ants, and the many other forms of spiders. The only point I wish to make is that this functional behavior is unconscious, call it instinct, inherited patterns for action or anything you may choose. This same inherited memory occurs in higher forms. Where the entire animal organism inherits an unconscious memory in lower forms of animal life, in man each cell inherits this same unconscious memory pattern. Then we consider the systems in man and the other higher forms of animal life and the same process, in a more complex fashion, takes place. The physiological, functional and psychic patterns of the glands of internal secretion are carried on—inherited as unconscious memory. This process continues, with infinite variations depending upon conditionings, situations and conflicts.

Thus we may continue in our consideration of unconscious memory and apply it to impulses. The racial experiences of the past are thus expressed in human behavior. If this is granted then we can assume that the repressions which were used in a less direct way originally are included in our inheritance.

INCEST.

Take the topic of incest. Earliest primitive man as far as we are able to ascertain did not trouble to bring up the question of blood relationship in the selection of his sexual partner. Consanguinity did not prevent sexual relationships. Later, in the totemic period we find the first traces of laws relating to marriage. The laws were drastic. We must try to answer the questions as to why the laws and why so severe. In following out our investigation it is necessary to consider some of the social or economic necessities. With the organization of man into tribes two things were required, strength and fertility. With the formation of the tribe war among men was begun. Prior to this time man's sadistic trend was satisfied by the energies expended in his ordinary occupations and in his battles with the elements and certain animals which were his enemies or necessary as food. In war prisoners were made and the men were slain or kept as slaves and the women became the secondary wives of the victors. So marriage by capture came to be. It was found that the sons of these captured women were stronger than those of the primary wives who belonged to the original tribe. Here we see the first pragmatic experimental breeding. It would not do violence to reason if we would credit primitive man with having noticed the advantages gained from crossbreeding as contrasted with close inbreeding, especially when the more vigorous sons meant stronger warriors and better protection for the tribe in warfare and in the hunt. With this knowledge laws enforcing exogamy were put into effect. These laws were rudimentary at first varying in different locales but always with the same end in view. Later they became more complex as an effort was made to solve certain difficulties encountered. We could go on and trace in like manner the matralinear and patralinear descents and the exogomous laws which each form developed but we have strayed as it is into remote by ways in an effort to gather some of the strands, which are woven into the fabric of the intricate psychological relationship existing between parent and child today.

Now for the cause of severity of the laws. Death was the usual penalty for any transgression. Brother and sister could not speak to each other after puberty unless a third person was present; they must keep a certain distance apart; the brother could not enter a room where the sister was alone; mother and son must turn from each other when they meet; taboos for mother-in-law and father-in-law; these were a few of the rules which were established among the various tribes.

In the more genteel warfare of today we find the death penalty for transgressions which receive a nominal punishment in times of peace. This would tend to reinforce the idea that the law was considered in the light of a war measure. During a war certain segments of the herd are in danger of defeat or extermination. This is what our more primitive forbears feared. Yet this would not seem to be sufficient reason to explain the laws which were handed on through centuries and executed with unrelenting severity. There must have been a tendency to break the law or there should have been no need for the law. The paradoxical phrase "laws were made to be broken" conveys the thought. There was a tremendous craving, a powerful driving sexual urge, which had to be overcome. The severity of the law was in keeping with the strength of the wish to break it. It would be fallacious to assume that the desire came after laws had been made, yet for the purpose of the argument it matters not at all if this had been the situation. The tendency to break the law must have been extreme, otherwise the punishment would have been less severe.

Propinquity and a growing sexual urge of a primitive character had to be curbed. These severe laws of centuries duration, in our more civilized communities are scarcely, if ever, referred to. The child is not told of the iniquities of incest, yet it does not in the ordinary case have to be punished as a means of prevention for these cravings. In pathological cases these cravings come to the surface. In dreams they appear frequently as frank sexual situations or in a disguised form depending on the situation, the strength of the wish and the ability to transfer the sexual libido to other love objects. In very young children or more broadly in children, incest may play a rôle psychical or physical. These traumatic situations often present themselves in the history of psychoneurotics. Sexual attempts or even sexual union may occur between brother and sister, uncle and niece; aunt and nephew and even between parent and child. I am not ignoring the promiscuity of this type which has been found among people of high culture as the Greeks, or which may still be seen among certain primitive peoples, certain tribes of Esquimos and Indians for example, but I shall not discuss these regressive situations.

The point I am trying to make is that our racial inherited unconscious carries the double load of the sexual craving for the object which comes within the circle of its youth as well as the inherited memory of the suppression which has grown from centuries of prohibition. This prohibition was not a moral or esthetic thing primarily but these attributes are present day rationalizations for a law which was established for the welfare of the herd. The entire situation is the result of the working out of an evolutionary purposeful project in spite of all roundabout hypotheses which have been worked out by well meaning egocentric scholasticists.

The child soon learns that sexuality is not a topic for discussion. Just why he is seldom told and when this information is given it generally is of a wrong kind. The very young child is unmoral. The child goes through the racial evolutionary stages at a tremendous rapidity. Freud states that the average child has completely repressed his incest tendencies at the age of six. When we find cases where adults retain incestuous tendencies we can with certainty ascribe this to a phase of retained or regained infantility. So the suppression of incest is consummated by the child at an early age. In other words it takes the child six years to go through the primitive cultural sexual phases of many generations of primitives in this space of time. The child by this time innately or unconsciously knows incest to be wrong. Before this time it has not suppressed the knowledge. We can assume that this cultural repression goes hand in hand with the development of the sexual striving or we can simply state that this is the present day period required for the completion of this stage of development. Unconscious painful memories have come to the surface and the task is done. Just as the unconscious memories of the spider's mating come into being at the necessary moment and the race is perpetuated. The spider is apparently not so highly developed as man. If man had to learn each act, if he did not have the aid of a racial unconscious memory he would spend his lifetime in acquiring a simple type of deportment as did his more primitive forebears.

CAUSE OF PARENTAL FLIGHT.

We now come to a consideration of the flight of the parent as shown in the four plays cited. In each case the parent who fled from the situation was of the opposite sex of the offspring. This then shows that the problem in these cases was not one of rivalry for a sexual object as is the case when the conflict takes place between father and son or mother and daughter. This phase of the problem is a story in itself and will be taken up at another time. We can attribute the flight from the situation mainly as one of avoidance of the problems of sexuality or the responsibility to sexuality. The parents did not, could not live with their children while the children were going through their processes of sexual development. In the process of identification first the memories of their own childhood difficulties regarding sex were reawakened. These difficulties were mainly in their relationship to their parents—of the opposite sex. So in the mechanism of identification the child now takes the position, which was a painful one in the parent's childhood, and they are fulfilling the rôle of their inadequate parent who in turn left them to solve the mysteries of sex. The former incestuous cravings are transposed and come to the surface in a new form. They flee from these cravings for the period when they found them most difficult to handle—the period of childhood. So they remain away to return at a time corresponding to the period when they finally could handle them—at the time of maturity. This time, however, they await the maturity of their offspring. This is understood when we consider identification.

It is to be noted that in each case, *Liliom, Mary Rose, Anna Christie* and *The Bill of Divorcement,* even when the child had reached maturity the parent again had difficulties in handling the relationship between parent and child and in *Liliom* and *Mary Rose* another flight occurred when the parent met the adult child.

I have taken up these pathological cases to illustrate my theme, realizing them to be extreme. However, the same situation in varying degrees is found in apparently normal families where various nervous disorders in parent or child or both are the only manifestations on the surface. Underneath these superficial indications we find these problems, after careful searching, to be at the bottom of a great number of familial difficulties. True, most of them are heavily veiled and on the surface another story is told. But this we find is only a rational disguise and it is our function to penetrate this disguise to get to the root of the disorder that it may be eradicated. Most of the cases of psychoneuroses and neuroses will reveal traces of the situation which I have discussed in this paper.

When well meaning antiquated psychiatrists tell us that we modern psychopathologists are dealing with things too filthy for the sensitive souls we can only point to the history of man, ontogenetic and phylogenetic, and show that those things are there. We did not write these histories. If human history is too coarse a subject for them they had best leave the treatment of mental disorders to the less timid, to those who are unafraid to face truth wherever it is found and so bring about an adjustment based on fact, an adjustment which will be lasting. Let us widen our conscious knowledge. These socalled vile things are there. What do the suave psychologists propose? To cover them up? That is where the trouble began. They had a serpent in the garden of Eden, the story is, and the trouble there began when they began to cover things up. We can only be rid of the serpent when we open things up widely, intelligently and for constructive purposes. Let us face things on an adult plane and help our unfortunate patients to solve their problems on an adult level. Freud has shown us how we may explore the unconscious. Let us make the most of this valuable therapeutic agent.

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Folie à Deux*

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(*From the Neuropsychiatric Wards of the Philadelphia General Hospital.*)

Folie à deux, though familiar to students of insanity, is actually a comparatively rare occurrence. In Schoenhal's experience of fourteen years he had met with only four cases that he could call induced insanity and which he stated comprises .028 per cent. of the cases of mental disease. A striking example having come under observation in the Neuropsychiatric Wards of the Philadelphia General Hospital illustrating the type described by the French as *folie imposée* with two others from the Pennsylvania Hospital for Mental Disease of a similar character seemed worthy of this brief report, inasmuch as some interesting features were presented.

Case I.—N. H., aged fifty-one, married, an only child, presented a negative family history and nothing in her previous history which had any bearing on her present disease. History of drinking was absolutely denied. The physical condition was practically negative, except for a coated tongue. The reflexes were not abnormal, the pupils reacted to light and in convergence, and the blood and spinal fluid Wassermanns were negative. The blood pressure was not elevated and the kidneys were not diseased. There was no evidence of arteriosclerotic change. That the patient had presented some personality abnormalities is shown in the fact that she believed in dreams and was regarded as clairvoyant. She also mistrusted banks and was always secreting her money in the house, in shoes and where not. She had lived unusually intimately with her husband during the last year due to the fact that he had not worked and they were thrown constantly together.

The trouble began two months before admission to the hospital. It appeared that she lived opposite a saloon where there congregated some rough characters. She believed it was a speakeasy and stated that she saw a barroom from her window. Taking down the curtains for the purpose of washing them gave rise to the idea that the people in the barroom believed that she was watching them. To get even with her she conceived the idea that the barroom people determined to kill her and her husband. She believed they were trying to get into their room and to take them away in an automobile. The police were notified on several occasions and she stated that the cops took off two but in spite of this they continued to try to get in through the windows. She was much frightened, so much so that she would often leave her dinner cooking on the stove and run out into the street in fear, often to the police station. She heard people trying to get in the window and heard them talking outside, threatening her. She decided to move from this house but the enemies followed her to the next place after a few days. Here an Irishman and an Italian tried to get in to take them away. The persecution became so great that she and her husband decided to leave Boston where the incident occurred and they moved to Philadelphia. They had not been in Philadelphia more than a day before the men who had apparently also pursued them on the train came around and attempted to get in. She then applied to the police for protection and they were sent from the police station to the Neuropsychiatric Wards of the Philadelphia General Hospital.

After admission to the wards, she saw two men but they went about their own business and she had not seen any one since. All this she reiterated was really true. She stated, "I am not like other people here who are crazy. Anybody would get sick if someone was following you around. I never imagined this. It don't worry me now, thank God, but it is really true. It is not imagination."

On examination, she showed marked persecutory delusions and ideas of reference. The train of thought was irrelevant. She made no suicidal or homicidal attempts since admission. She was quiet, respectful, fairly clean about her person, sat around and talked with the other patients. The attention was poor, the affectivity was little involved and the memory was good.

There was a gradual improvement after admission but insight into her condition was lacking until the last few days, three months after admission and five months after the onset of the symptoms. She now recognizes that the delusions and hallucinations were products of her imagination, as she puts it, and that she was nervous and upset.

Case II.—H. H., her husband, aged fifty, an awning maker, of German parents with negative family and previous histories, had suffered from progressive muscular atrophy for two years. No venereal or alcoholic history. On admission January 27, 1922, the examination was as follows: Tongue protruded straight in median line, no atrophy. Abdominal reflex active on both sides, biceps jerk active on both sides, no spasticity in the gait apparent and no spasticity in arms, no Babinski, no Chaddock or Oppenheim, knee jerks two plus, no evidence of atrophy of legs or feet, station good, no sensory changes, pupils unequal and irregular, foul mouth, enlarged nodes on neck, chest and lungs negative. He had perfect orientation, good memory, and was happy and carefree. The patient was a very good helper in ward work and, except for his firm adherence to his delusions, seemed normal.

There was marked atrophy for the flexor group of the muscles of the right forearm. The thenar eminence was atrophied and the hypothenar eminence slightly so, interossei muscles quite markedly atrophied, biceps and triceps were not atrophied, posterior third of both deltoids was markedly atrophied, some atrophy of the supraspinati and infraspinati muscles, more marked on the right than on the left, left thenar eminence was much atrophied, also the interossei, and to a less extent, the hyperthenar eminence. The left forearm muscles were atrophied but to a less extent than on the right side and the flexor more than the extensor group.

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His statements on first entering hospital: "My wife first heard voices beneath the window. We took down the curtains to be washed and the gang on the corner said we were taking them down so that we could rubberneck. We heard remarks from the neighbors on the outside that the gang was after us. We lived on the second story right next to the corner—a bad corner. The gang started to raise trouble and were trying to pull us out the window. They never bothered us in the daytime, only at night. We saw people looking in the windows. The house seemed to be a rough place but we did not know it. We notified the police at the station around the corner. Then we moved away to the South End and after three nights the gang was after us again. The people on the second floor were acquainted with the people in the first house and they found out in this way where we were. We notified headquarters again. The gang came down every night and looked in the windows. We moved then to Philadelphia, on account of work, because there was more opportunity. We weren't here two nights before they were trying to get in the window. We notified the police here and told them the whole thing. They took us to the station house and then brought us out here. Since I have been here I have not seen them. My wife first noticed the things and told me about them."

To sum up this case, a man apparently in good health and normal mentally, after a short time believed his wife's delusions and heard the same voices which she described to him. He had delusions of persecution, hallucinations of hearing and ideas of reference. His attention was fairly good, his memory was intact, he seemed to be normal in other respects.

In this instance, the primary psychosis occurred in the wife, a dominating personality. As far as can be learned the husband was in a normal mental state but his wife, by constantly talking to him about her delusions, finally convinced him that it was all true and fell in entirely with her viewpoint. The delusion which he developed was precisely similar to that of his wife.

Her ideas seemed to have some foundation moreover, because there was a saloon opposite and crowds gathered repeatedly on the pavement in front, from which it could be concluded that there was a speakeasy there. The delusions developed as a false interpretation of actual facts. The wife in this case communicated the delusions to the husband who was the weaker personality. There was no bad heredity which could be traced. They were happily married and devoted to each other and being childless were thus the more intimately thrown with each other, a factor in the development of the secondary psychosis.

In these cases there was present a paranoid state with ideas of reference and hallucinations of hearing and sight in individuals who had previously not been psychotic, occurring in the presenile period in both instances, who showed the same delusions, first occurring in the wife whose personality was the dominating one, neither exhibiting deterioration, disorientation, marked change in the personality, judgment, affectivity or pronounced changes in the arterial system, and in whom no physical basis could be found to explain a possible toxic origin of the symptoms.

These cases illustrate the type of psychosis described by the French as *folie imposée,* which Marandon de Montyel stated was a disease in which one affected with a psychosis transmits to another with whom he was living intimately and in secluded association, a similar psychosis which recovered when the subjects were separated. My cases do not fulfill entirely these conditions, for while the woman in whom the psychosis originated has entirely recovered with complete insight, the man is still convinced that the delusions are real, while admitting now that his wife has given them up he should too, but he doesn't quite yield.

For the third case I am indebted to Dr. Edward Strecker for the privilege of reporting.

CASE III.—J. Z., female, aged fifty, had had three attacks of mental disease—one eleven years ago, one five years ago and a third during which she had ideas of reference, depression, agitation, apprehension and ideas of persecution which developed during the Great War and many of her delusions could be referred to it and to the fact that she was German. The elder sister, M., intimately associated with her throughout life, was always closely attached to the patient and dominated by her, the patient having the psychosis being of a stronger personality. This sister M. was unwilling to make any plan without the sanction of the patient. Apparently, however, in M. mental symptoms did not develop until the third attack of the patient J., but she then agreed to many of the paranoid ideas, was apprehensive, admitted she was "a little crazy," was hallucinated, voices made her laugh and they laughed at her pronunciation of English when she read a paper and she felt she was watched when she undressed. Her symptoms were generally the same as her sister J.'s, the patient, but in less marked degree. The sisters lived and worked together for twenty years as cook and maid.

Here two sisters living intimately under the same conditions manifested similar psychoses of a paranoid type, the primary psychosis occurring in the sister with the stronger personality who imposed upon her sister a similar secondary psychosis, of the *folie imposée* type.

For the fourth case, I am also indebted to Dr. Strecker who kindly put at my disposal the records from the Pennsylvania Hospital for Mental Diseases.

CASE IV.—Mary G., aged forty-three, single, in whom the psychosis first developed two weeks after a fall down stairs. She believed people were stealing her poems and were in league against her. She heard psychic voices at night that said horrible things. The whole neighborhood was plotting against her, were immoral and had houses filled with men. She was afraid of being murdered, and poison was put in her food. She was violently resistive, shouted out to the neighbors, threatened to kill herself and had ideas of wealth and grandeur. She and her mother and sister slept in the same room for sixteen years. There was no history of insanity in the family except as to be related later.

The mother, aged seventy-five, was educated in a Moravian seminary and was valedictorian of her class. She was always cheerful, agreeable and optimistic. She married a wealthy man at seventeen and had an unusually happy and prosperous married life. There were three children with difficult births. Two years after the death of her husband, she lost all of her money, followed a hand to mouth existence, often not having sufficient food. She had scarcely left the house for the last five years. A wealthy man wished to marry her but she refused.

The mother became insane five weeks after Mary G. and a psychosis developed, consisting of ideas that poison was being placed in her food and of suspiciousness. She made speeches to the throngs and saw ghosts. It began by her refusing to eat—she found a pearl in her food worth $50,000. She called the visiting physician a devil, she was his wife, he was the King of Austria, she the Queen. Periods of excitement followed. She believed her husband was living and conversed with him and with Lord Kitchener. Her general condition upon admission was poor and there was a slight systolic murmur. She died two days after admission of cerebral hemorrhage.

One daughter died an accidental death at thirty-eight. She fell out the window while walking in her sleep. Her mind appeared to be confused for two months previously. She was peculiar and would not take medicine for fear it was poisoned and would not go out for fear she would fall over dead.

In a second daughter, aged forty-nine, a psychosis developed similar to that of Mary sometime after the latter became insane, but just how long is not known. She was living with her at the time and sleeping in the same room. She visited her sister, Mary, in the hospital and said, "Why is my sister treated this way unless there is some plot behind it to unhinge her mind?" In 1921 both sisters presented the same symptoms, were still hallucinated, calling out of the windows, were noisy, resistive and paranoid. A diagnosis of paranoid dementia præcox was made in both cases.

In this instance, the insanity of the mother was no doubt an instance of *folie simultanée* and may or may not have been determined by the insanity of her daughter. The secondary psychosis in the sister was no doubt an example of *folie imposée*.

Folie à deux was described by Lasègue and Falret (1) in 1877, though a quarter of a century earlier Wollenberg (2) described instances of familial mental infection, while Hofbauer (3) in 1846 was the first to describe induced insanity, but Lehman (4), in 1883, appears to be the first to use the expression "induced insanity."

By *folie à deux* is meant a mental disorder which occurs in two or more individuals who are intimately associated with each other in which the delusions, principally of persecution, appear to be transmitted from one to another in individuals who are predisposed.

Partenheimer (5) looked upon induced insanity as applying only to cases in which the patient who has no acquired or hereditary predisposition to mental disease, manifests a paranoid psychosis through actual contact and association with one suffering from insanity, the symptoms being similar in type, persisting and remaining of an independent character after the two individuals are separated. On the other hand, Legrand de Saule (6) regarded induced insanity as one in which the primarily affected individual completely dominated the second one. The latter, however, should not be regarded as actually insane but as merely being capable of being influenced, provided he is of low mentality. In this connection, Baillarger (7) calls attention to the important distinction between actual mental derangement and mere impressionability. Regis (8), on the other hand, who regards *folie à deux* and *folie simultanée* as synonymous, defines this disease as a psychosis developing in the same way in two individuals, each to a certain extent mutually responsible for the psychosis rather than illustrating the psychosis produced by one person on another of less intelligence.

The French describe three types, namely, *folie imposée, folie simultanée,* and *folie communiquée.* Marandon de Montyel (9) refers to the cases in which actual transmission of a psychosis occurs as those in which the patient appears to impose his hallucinations upon the second individual in whom the hallucinations are only apparently or partially accepted and which are thrown off as soon as he is removed from the influence of the other, this being the *folie imposée* of the French. He makes the following distinctions:

1. The *folie imposée* is one in which one individual affected with a psychosis transmits to another with whom he is living intimately and in secluded association a similar psychosis, from which, when the two subjects are separated, the latter recovers.
2. By *folie simultanée* is meant that psychosis in which two subjects are simultaneously affected by the one and the same psychosis arising from the same external factors, in which, therefore, transmission plays no part.
3. *Folie communiquée* represents a psychosis in which the mental symptoms of the primary subject become firmly rooted in the second subject but in both of which new elements arise and a true independent psychosis occurs and which persists and progresses even after separation from the active factor.

Tuke (10) classified the disorder as follows:

1. Cases in which "an insane person distinctly infects another person with the same mental disorder."
2. Cases in which "the person becomes insane from companionship not in consequence of direct transference of morbid ideas but in consequence of the shock arising out of painful impressions caused by witnessing the attack or the strain of nursing the patient."
3. Cases in which "two or more persons become insane simultaneously from the same cause."
4. Cases in which "one lunatic infects another lunatic with his special delusion."

Lehman believes that the term *folie à deux* is not correct as there seems to be two kinds of cases described in the literature; namely, 1, those in which there is an implantation of mental symptoms on the second individual as a result of constant observation of the disorder and perhaps of battling against it and 2, cases in which the person becomes mentally affected as a result of being closely associated with another person with mental disease, particularly relatives or close friends. The resulting psychosis may be the same or not as that of the original one.

The essential criteria, according to Wollenberg (2), for the development of this phenomenon is, 1, imitation and 2, baneful influences which an individual consciously or unconsciously exercises on his associates, not including the *folie simultanée* of the French. He concludes that hysteria is a type which can be most easily transmitted.

Müller (11) believes the diagnosis of induced insanity can only be made when the normal subject, acquiring the insanity, has been associated intimately and for a long time with another individual suffering from a psychosis and in which the hallucinations or delusions develop independently, so that the essential elements of the resulting psychosis correspond to those of the original one.

There are two types of phenomena, namely, those in which the induced psychosis differs from the original and those in which the induced psychosis resembles the original in symptoms and evolution but differing in degree. Students of this form of disease agree for the most part that the compromised subjects have distinct hereditary taint, the passive subjects being the weaker.

Halberchstadt (12) refers to a type similar to the one reported in this paper, representing a true case of insanity by contagion as consisting of a psychosis on the basis of a delirium of interpretation with feeble systematization and relatively slow in development, generally occurring in subjects already weakminded.

For the most part, the influence of heredity is emphasized by writers on this subject. Marandon de Montyel, who in 1881 first described the condition called *folie communiquée,* emphasized the importance of hereditary predispositions in the subject secondarily affected. Werner (13) found in forty-five cases of induced insanity, blood relationship on both sides in thirty-four cases.

According to Filassier (14), heredity plays a most important part, strikingly illustrated in the insanity of twins. On the contrary, heredity does not, according to Kroner (15), play any greater part in these psychoses than the development of psychoses in general, and he believes that consanguinity is of greater importance than close association of the subjects. He believed that husband and wife were rarely affected. This type of psychosis does not actually belong to the familial psychoses, in which Demay (16) has shown there is nothing of the symptom complex nor in its development which differentiates them from psychoses occurring in isolated individuals. For him, the term familial psychoses refers to similar mental conditions occurring in individuals of one and the same family but not in the sense of a particular group such as is seen in familial nervous diseases. This disease, he states, occurs from mental contagion under the influence of the family life and consists of hallucinations and interpretation delirium. Actual family psychoses are those in which manic depressive psychoses or dementia præcox are most frequent.

Newcomb (17) emphasized the importance of heredity, and the occurrence of this form of insanity, in his opinion, is a most striking manifestation of this, although he can see the influence of induction on account of the same environmental conditions during the early period of development. The type of insanity in the three cases which he reported was dementia præcox.

Environmental influence is a striking etiological feature as demonstrated when two persons have close similar associations during the early period of the development of the psychoses.

Schönfeldt (18) believed that in order to make a diagnosis of induced insanity, this must result directly from the influence of the first subject. *Folie communiquée* he regards as induced insanity being due specifically to the first subject which he regards as the active factor and even when separated from the latter the secondary psychosis continues to evolute in the same manner as in the first case. Lagrand de Saule also asserted that the primarily affected individual dominates the second one, while Regis defined *folie à deux* not so much a psychosis induced by one person on another of weaker intelligence so much as a psychosis developing in the same way in two individuals, each being mutually responsible for the psychosis.

Ast (19) believes that a communicated psychosis does not actually exist, believing that when the secondary disease is a psychosis, the primary one is merely the determining factor in the presence of predisposition which acts on the form and content of the symptoms complex, except in occasional cases where a perfectly normal individual may be influenced by an abnormal companion to the point of an actual psychosis which merely is different in that recovery occurs after isolation.

According to Müller, females are on the whole more susceptible to psychic contagion while other etiological factors consist of excessive brain work, alcoholism, syphilis, and close intimate association. He pointed out that the fact that paranoics being capable of giving a certain degree of plausibility to their delusions and hallucinations are therefore more likely to influence the weaker subject.

Instances of *folie à deux* are on record as occurring in mother and daughter. For example: In a case described by Dromard and Levassort (20) the mother aged fifty and a daughter aged thirty, after the suicide of the husband and only son, were thrown closely together in retired life and a struggle for existence. The daughter there developed hysterical manifestations of greatness and of religious persecution. The mother believed the daughter's delusions and claimed exaggerated accomplishments for her daughter from her earliest childhood. The case was recorded as one of hysteria. He admits that this does not fulfill the classical requirements or conform to the *folie communiquée* but is rather one of *folie simultanée.*

Conjugal insanity has been reported by a number of observers. In Partenheimer's four observations there were two instances of husband and wife in one case of which the wife developed a psychosis and the husband, first attempting to disabuse her of her delusions, later began to agree with her for tactful reasons apparently and finally believed in her hallucinations himself. Both the psychoses in this case belonged to the dementia præcox group. After separation from his wife, he recovered. Partenheimer believed this was due to emotional sympathy on a hereditary basis and could not be considered one of induced insanity.

Adam (21) described instances occurring in husband and wife in which the husband adopted the delusion of his wife and did not believe she was insane. In the second case, the *folie imposée* type of Lasègue and Falret, the husband and wife had lived together in seclusion for a long time and the man developed insane hallucinations of persecution on a hereditary basis and the woman, the less intelligent of the two, adopted the hallucinations but recovered shortly after separation.

Insanities occurring in man and wife have been reported also by Ast in three instances, in the last of which there appeared to be no hereditary taint.

Paris (22) described a case in which acute mania developed in a young woman with hereditary depression. The perfectly normal husband acted as her nurse, taking little rest and nourishment and after two days of constant contact with the patient, there developed in him a similar psychosis.

Schoenhals (23) cited a case in which the parents with "converged hereditary taint" had three sons in whom there developed similar forms of insanity. The younger children adopted the ideas of the parents and the elder brother. The author recognized this as an instance of suggestive influence and the exercising of authoritative influence by the active subject. He regards the case as one of *folie imposée*. In the second case, one of *folie imposée*, a rather weak young man, without hereditary taint, was asked by a rich client, who was a paranoic with persecutory hallucinations, to procure papers for his release from confinement. After several interviews with the patient and his wife, in whom there also had developed her husband's delusions, the young man finally manifested a similar psychosis. The third case cited was of two sisters, living in retired seclusion, in which the stronger one imposed her delusions on the weaker of the two. The symptoms persisted in the latter after they were separated. The fourth case was one of actual *folie simultanée*. In the two sisters, free from hereditary taint, there developed hysterical psychoses which were uninfluenced by each other but both of whom were under the influence of the same family troubles.

Insanity in twins may take the form of *folie à deux*, though most instances of this type of psychosis are examples of a different origin. *Folie gemellaire,* a form of insanity which occurs in twins, was first described by Ball (24) in 1894, who regarded it as a clinical entity and unlike *folie à deux*. It is due, he claimed, to a high grade resemblance in the structure of the brain of the twins so that the cerebral function in the two run a parallel course, both psychologically and pathologically. Psychoses in twins must necessarily depend upon simultaneousness of occurrence, similarity of the mental symptoms and the spontaneity of the delirium of each individual, according to Ball.

Schultes (25), in discussing *zwillings psychosen,* reported five cases of psychoses among twins, four sets of girls and one of boys. The type of disease was alike, manic depressive in two, dementia præcox in two and in the fifth case one presented manic depressive insanity and the other hysteric degenerative insanity. Induction and heredity were the important factors. Bajenoff (26), in discussing *folie gemellaire* reported similar psychoses in twins, one having been communicated by the other. Campbell (27), until 1902, had only found twenty-nine cases of psychoses among twins in their literature. Elminger (28) regarded twin psychoses as genuine only when the two patients were affected by the same or similar psychoses which developed independently of each other and ran a similar course. Other cases, he believed, were simply instances of induced insanity. *Folie à deux,* in twins, he asserted, did not belong in this category.

In Elminger's six cases of psychoses among twins, in only one half were both twins affected, while in the others, one of the twins remained well. These psychoses represented a type of dementia præcox in which the element of induction can hardly be assumed to play any part. Euphrat (29), on the other hand, takes the view that twin psychoses are analogous to *folie à deux*. He calls attention to the fact that in most cases there is some circumstance which affected both twins emotionally. In seven cases reported, he found hereditary factors in only one.

The types of insanity which occur in *folie à deux* are acute mania, paranoia, melancholia, dementia præcox and hysteria. Among 137 cases of induced insanity, Kronen found that ninety-one were paranoics and two melancholics. Boyd (30), from his studies, believed that among the simultaneous insanities, dementia præcox predominated.

Paranoia is, according to Müller, the originating factor in most cases of induced insanity. Meyer (31) reported a case of induced paranoia in which the inducing insanity was dementia præcox. In a case reported by Boyd, a daughter was the active agent, being a case of dementia præcox. During the exacerbation of the disease, the mother acquired the hallucinations and delusions of the daughter.

The type illustrating contagion, according to Halberchstadt, is that in which the psychoses develop on the basis of a delirium interpretation with weak systematization and relatively slow development, occurring among weakminded subjects. Müller's psychic contagion and psychopathic epidemics are familiar phenomena.

It is apparent that there are several types of insanities which occur simultaneously in two persons who have been closely associated. In twins induced insanity may be observed as well as a coincidental occurrence of insanity, instances of which are familiar as occurring in families in which predisposition and similar exciting environmental influences play important etiological parts. There are also instances of insanity occurring simultaneously in two persons intimately associated which may be of independent etiology. There also occur insanities in two persons living in close association in which the secondary psychosis resembles the primary one which is the result of contagion or suggestion, without apparent hereditary basis and which assumes a paranoid state in which the prognosis for the secondary psychosis is good.

The references will appear in the author's reprints.

Notes on a New Treatment for Mongolian Idiocy

With a Brief Review of the Symptoms and Signs

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I have been rather surprised to find that among a large number of otherwise intelligent and well-informed medical men who have worked in my clinic in the last few years, few or none are able to recognize a Mongolian idiot the first time a case is shown. I have therefore thought that it might not be uninteresting to note briefly and informally the clinical facts that may be gathered from the recent literature of the subject, and in the same connection to describe a new treatment which seems to be of value when the patient can be got hold of at an early enough age.

I have no solution for the pathological puzzle the disease presents. The vast literature of the subject has only served to increase the difficulties of the etiological problem. What I said of this (1) some years ago still holds true:

"We are told that the patient is usually one, often the only abnormal one, and often the last born of a large family of children. H. H. Goddard (2) has collected statistics of 294 Mongol children of whom fifty-one per cent. were the last born of families of more than one child. This seems to be of some significance; but on the other hand the last four patients of this class recently brought to my office were all first born, and all the only children of their respective parents. The problem is further complicated by reports of twins one of whom was a Mongolian idiot, and of twins both of whom were Mongolian idiots. There are a number of reports of two Mongolian idiots in one family of children, and Babonneux and Villette (3) have recently described four cases in one family. The father was a mason, in good health at the time of the report. The mother died at the age of fifty-seven of pulmonary tuberculosis. During her childbearing age she had first two miscarriages, then in succession and at term ten children. Six of these died in infancy, mentality undetermined; the four surviving offspring were all Mongolian idiots. Such a horrid narrative might well have served for the original of Joseph Conrad's dreadful story.

No hereditary or racial element in the problem has ever been worked out. To quote again from the paper just mentioned: "The fathers are often unusually clever—good business men, successful musicians, cultivated linguists. Maternal ages run all the way from sixteen to fifty-five (2), and many of the mothers have been exceptionally intellectual." Of the negro race little or nothing has been reported, so far as I can find, but "there is no ground for believing that the Jewish race is in any essential measure exempt from the accident (4). Rolleston (6) has still further complicated the pathological anatomy by reporting the weight of a Mongolian brain removed at autopsy at one year of age as heavier than the average for normal babies."

As to symptoms the face is characteristic. One has only to glance at the slanting socalled Chinese eyes, the coarse hair, red eyelids and blunted occiput. Congenital anomalies, such as a hairless scalp, or a tear sac fistula, may be present. The skin is rough. A very short little finger is often present. The joints are much relaxed, and the child's legs can be almost tied into a knot. The diagnosis may be readily made in the newborn infant—even (so it is stated by one English writer of a good while ago) in the prematurely born fetus. The disease is possibly caused by some early slipping of a cog in the mechanism of growth in the embryo; but this is guesswork. It is, however, a very definite and specific accident, and the features of the child are marked in such a way that many of them from distant quarters of the globe would pass for brothers and sisters in the same family. It is said that parents visiting an institution where a number of Mongols are cared for often cannot pick out their own children from a group of defectives of the same class.

In the matter of disposition it is a curious fact that Mongolian idiots are sweet tempered, placid and docile, and require but little discipline. They become favorites everywhere, and are the spoiled darlings of the family. There is from birth a remarkable difference in the mental gifts of these children. Some of them are high grade from the beginning. I now have one in my care aged nine years who can hardly be distinguished from a normal boy of seven or eight years. Another of my little patients aged eight has a remarkable talent for music, and knows by heart the words and music of more than one hundred classical ballads and songs. We are hoping that his thin childish voice will develop later on into something which will be a source of pleasure to himself and his friends.

On the whole, however, it seems to be true that when untreated the patients rarely attain a mental age of more than five or six years (2). They are relatively nonresistant to intercurrent disease, and not many reach adult years. Pogue (5) tells a remarkable story of one Mongolian idiot girl who grew up safely and married. She was pregnant twice. One child miscarried; one was born at term, and was not a Mongolian idiot.

In the matter of treatment, to which we now turn, there have been many patient and painstaking efforts—with but little consistency or success in the reported results. Thyroid extract has been suggested of course; and a few observers have written favorably of it. Dr. Pogue in the interesting paper just mentioned has recommended thymus and pineal gland. Ordinarily the attending physicians feel justified in telling the parents to give up hope.

In view, however, of the anguish the parents of these babies so often suffer, and having of recent years had pluriglandular defects very much in my field of work, I have selected a series of cases at my clinic, and in my office, and have systematically administered a number of glands, and pluriglandular mixtures. With my last formula, a mixture of thyroid, pineal, pituitary and testis (or with girls ovary) I have had some encouraging and gratifying results.

No one understands better than myself that such a clinical method of study is open to reproach. But a parallel series of scientifically similar controls cannot be had, and one must be content with a comparison of the child's mental and bodily growth for like periods of time before and after treatment, and must observe a large number of cases. This I have done. The patients do not improve as cretins do on proper doses of thyroid; but parents, nurses and physicians in charge of the cases have very generally volunteered their praise.

The patients must of course be rigidly examined. X ray films of the skull (profile) should be a routine measure. When possible the spinal fluid should be tested for the colloidal gold reaction. Though syphilis has no relation to Mongolism as far as anyone knows, the Wassermann reaction should be reported on general principles. Moreover, it is positively essential to use pure and fresh extracts of the glands mentioned. If the pharmacist is to advise or select for you, you are taking a very unnecessary risk. My formula is put up for me by a manufacturer in New York who specializes in internal secretions.

The quantities of each ingredient should be fitted to the apparent needs of each patient. In cases without special features the children may receive three times a day a tablet consisting of one half grain each of the four glands mentioned above. Unfortunately the basal metabolism test is not available for very young children, but where the mental hebetude is great, systolic blood pressure less than sixty mm., and the teeth slow and atypical in their eruption, the amount of thyroid may safely be doubled. It happens with some patients also that the testes are very small and soft. In such an event the quantity of testis extract may be doubled or trebled. The best effects are to be had—as always in endocrine disorders—from frequent small doses continued over a long period of time. I do not know at all that Mongolism is a primary endocrine deficiency, but there seems no question that this method is beneficial. Results are better when treatment begins in early infancy, but cases started after the fourth year have done well, and I can recommend it for all Mongol children under ten. There are no contraindications.

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Tumor of the Middle Fossa with Autopsy Findings

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Tumors of the middle fossa usually affect the nerves going to the orbit. Symptoms indicating involvement of the fifth are especially prominent. In one case reported by Oppenheim there was exophthalmos, and mild involvement of the third nerve with, however, a narrow pupil. The patient gave a history of headache for eight years. The sensory changes were present in the cornea first; later there developed amaurosis of one eye and temporal hemiopia of the other. Finally there was both optic and sensory aphasia from involvement of the temporal lobe. In another case observed by him there were facial twitchings, and the paresis of the third nerve varied from time to time.

Hartman (1) speaks of the relation between these tumors and extracranial neoplasms of the pharynx. He stresses the fact that most fibromata, arising in the posterior fossa, first involve the eighth nerve, while the middle fossa tumors are mostly trigeminal in origin. In a number of the latter he has found associated neoplasms in the parotid and at the angle of the jaw. According to this observer the involvement of many cranial nerves suggests sarcoma, while early amaurosis with or without local findings points to carcinoma. Most of these tumors are fibromata and fibrosarcomata; endothelioma is rare. Optic neuritis is infrequently in middle fossa tumors.

Cadwalader (2) stresses the importance of the chronology of the symptoms. Early involvement of the fifth favors the diagnosis of middle fossa tumor, particularly neoplasm of the gasserian ganglion. Redlich (3) also emphasizes the rarity of choked disc. He has noted olfactory changes at times and very rarely palsy of the seventh nerve.

We have recently had occasion to observe two cases of tumor in this locality with a number of interesting findings. The clinical diagnosis was verified in the first case by postmortem examination; in the second case the autopsy findings showed more widespread lesions than we had assumed.

CASE I.[1]—Endothelioma of the dura of the middle fossa with gustatory fits. J. S., sea captain, aged forty-nine, widower. Born in the United States, admitted to the service of Dr. Foster Kennedy, at Bellevue Hospital, June 14, 1920. The family history showed that one sister had died of carcinoma of the mamma. The patient sustained an injury to the back of the neck two and a half years ago.

About two years ago patient suddenly noticed noises in the left ear, with the sensation of cold in the head. After two months his hearing became impaired. Soon after the onset of the deafness he experienced pain in the left ear and face. For the last three weeks there has been numbness of the cheek, lips, and nose on the left. The left side of the tongue feels scalded. For some time the left eye had been getting smaller. There was headache, particularly on the left side, considerable dizziness but no vomiting.

A physical examination on June 15, 1920, showed that sense of smell and fundi were normal; no hemianopsia. Visual acuity was: left 10-15, right 10-15. The left pupil was smaller than the right, both reacted to light and accommodation. The left palpebral fissure was narrower than the right. There were no ocular palsies or nystagmus. The motor fifth was intact, the sensory fifth showed hyperalgesia, the seventh was normal. Impaired hearing was present on both sides, more marked on the left. The left trapezius was possibly less active than the right. There was some tremor of the arms. A tumor was felt in the neck on the left side below the angle of the jaw. This was freely movable and was about the size of a small orange. The left ear drum was retracted. There seemed to be some bulging of the roof of the meatus. Reflexes of the upper extremities were normal, abdominals and cremasterics were present, knee jerks and ankle jerks were normal, Babinski's sign was absent. Sensation in the trunk and extremities was normal. Gait and station were normal. Heart and lungs were negative. The blood pressure was 135/70. X ray examination of the skull on June 15th showed some thickening of the bones of the vault of the skull, but no evidence of tumor. The urine examination was negative. On June 17th there was increased resistance in the soft palate on the left. June 19th the spinal fluid was clear and under moderate pressure showed 234 cells; globulin was increased. Fehling's solution was reduced. The blood and spinal Wassermann tests both proved positive on June 20th. The goldsol curve was normal. The patient was given potassium iodide and mercury inunctions. The temperature was normal, pulse 64 to 80, respiration 16 to 24. The most striking symptom was pain in the left side of the face. On June 25th there was diplopia and impaired vision on the left. On the 30th marked weakness of the left sixth. July 1st the patient was given 0.45 grams of neosalvarsan. On the 5th pain in the face was marked. There was salivation and evidence of iodism. The medication was stopped.

He was discharged on July 11th with the probable diagnosis of lues although tumor at the base of the skull was considered. The patient was readmitted July 21, 1920, still complaining of pain, numbness and a feeling of coldness in the left side of the face. Since his discharge from the hospital the pain had become severe, coming in socalled flashes. There was also a constant, dull, nagging pain. While in one of the other wards for an examination of the ears the patient became dizzy in his chair and almost lost consciousness. He was given some ice water which he "felt only on the right side" of the tongue and mouth. Physical examination July 22d showed the following: Pupils, left smaller, both reacted well. There was ptosis of the left upper lid, left external rectus was weak (diplopia), motor fifth was normal. Sensory findings were as noted previously. Sensation was diminished on the left side of the tongue. His hearing was poor on the left. The mass at the angle of the jaw persisted. There were no motor or other sensory changes. Reflexes were normal. Neosalvarsan was administered. The spinal fluid was again withdrawn. It was found to be clear, showed fifty-six cells and increased globulin, Fehling's solution was reduced, spinal Wassermann test was positive, the colloidal gold curve was weakly luetic. On August 17th it was noted that the patient had complained of a persistent objectionable taste in the mouth for the past few weeks. The taste resembled Jamaica rum. The pain in the face on the left was severe. The administration of neosalvarsan was continued. On the 31st the patient was discharged with pain in the left side of the face and paralysis of the external rectus on the left.

During his second stay in the hospital the patient had three seizures about one week apart. The attack was preceded by a sharp intense pain in the left side of the face. Things immediately became dark before him and the patient had to struggle to keep from falling. Vertigo was present. Objects seemed to move to the left. There was no loss of consciousness. Drooling from the mouth occurred, saliva tasted to him like Jamaica rum. The duration of these attacks was from five to ten minutes. The arms and legs felt stiff. There was no cry or incontinence. The patient lost vision in the left eye in the interval between his second discharge from the hospital and his third admission. Since the patient's discharge on August 31st, the pain in the left side of the face grew much worse. The left eye became more prominent and the swelling in the neck larger. On September 7th the findings were unchanged. The left ear drum was found to be thickened and retracted, the right was normal. Examination of the pharynx showed that the entire left palate was edematous. The fullness also extended downward for some distance but no distinct tumor mass was made out. On September 9th there was complete paralysis of the left third nerve. The pupil, however, was still smaller than the right and almost fixed, the right was irregular and sluggish to light. On the 11th the patient had an attack. It began with a chill followed by a burning sensation in the left side of the face. The patient became weak. There was trembling of his hands, followed by a profuse perspiration all over the body. When seen a half hour after the attack he simply looked pale. Plantar responses were flexor. On September 12th fibrillary twitchings were noted in the masseter muscle on the left. On the 13th x ray examination of the head showed no abnormal findings. Blood examination: White blood cells, 6,000; polynuclears, sixty-six per cent.; lymphocytes, twenty-four per cent.; transitionals, six per cent.; eosinophiles, four per cent.; hemoglobin, ninety per cent.; red blood cells, 4,700,000. On the 14th smell was impaired on the left side. Left third completely paralyzed, the pupil, however, was small. The sixth nerve was also paretic. It was a question whether the motor fifth was involved; jaw was immobilized on that side due to mass in neck. The sensory fifth showed complete loss of function on that side. Taste was impaired in anterior part of tongue. The seventh was normal on voluntary innervation, although there was a slight drooping of the left angle of the mouth. This was interpreted as being due to the sensory loss in the face with resulting loss of tone. There was no herpes. Hearing was impaired on the left. There was, however, no nerve deafness (in the Weber test the tuning fork was lateralized to the left). Innervation of palate and tongue seemed normal. Fundi were hyperemic especially on the left. There was percussion tenderness of the skull on the left. Vision was lost in the left eye. The fields on the right were intact. Twitchings were noted from time to time in the orbicularis palpebrarum. There was no aphasia. The rest of the neurological examination was negative. A diagnosis of neoplasm involving the middle fossa of the skull was made. The patient refused operation. On September 1st neosalvarsan was administered. On October 17th no brain stem phenomena were present. The ptosis was a bit better. There were no changes in the other findings. The patient had lost ground; this in spite of antiluetic therapy.

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[1] Case presented at the meeting of the New York Neurological Society, February 1, 1921.

On October 19th the patient noted that he felt only half the cup in drinking. On the 20th the laryngologist still found no mass in the nasopharynx. December 2d the left pupil was now larger than it had been and responded sluggishly to light. There was a tendency to hippus. The ptosis was less marked and there was recovery in ability to rotate the left eye inward. The external rectus was now definitely paralyzed. The superior oblique also shows more loss of function. There was neuroparalytic conjunctivitis on the left and drooping of the left angle of the mouth. The rest of the status was unchanged. Fundi showed blurring of the discs especially marked on the left.

On December 9th the knee jerks were feeble, the right more so than the left, ankle jerks were not elicited. The abdominal reflexes were present and lively. There were no pathological reflexes. While in the bath room on December 19th the patient had a sudden attack in which he felt a dragging sensation in the left ear. He became weak, collapsed, striking his head on the floor. Since then his hearing has been much worse. On the 20th there were no brain stem phenomena, right fundus was practically normal, left showed papilledema, retinal veins were dilated and tortuous; evidence of retrobulbar pressure rather than choked disc. On the 21st x ray examination of the skull showed no evidence of sinus involvement. On the 25th the patient complained bitterly of severe pain in the left ear. There was a purulent discharge from the mouth and his breath was offensive. There was a rise in temperature, beginning about the 24th and persisting until the end. On the 28th the left eye ball was very prominent. There was marked neuroparalytic conjunctivitis on the left and the palate was markedly swollen on the left. On the 30th the patient became delirious, got out of bed; showed incontinence of urine. January 1, 1921, x ray examination of the chest showed no metastatic foci in the lungs, chest or bony thorax. The patient died January 4, 1921.

AUTOPSY FINDINGS.

The dura was very adherent to the cranial vault, and was removed with the calvarium. The convolutions were flattened to an extent indicating a considerable degree of intracranial pressure. On endeavoring to lift the brain out of the skull, a resistance was felt at the tip of the left temporal lobe, and it was found to be adherent to a tumor growing from the dura of the middle fossa. It was detached without much difficulty, however, and the growth did not appear to involve the cerebrum.

The tumor was flat and roughly circular, the widest diameter being about four cm., and the greatest elevation one cm. It occupied the middle two thirds of the left middle fossa. It had grown over the hypophysis, and overlapped the basilar portion of the sphenoid, a portion of the lesser wing, and part of the petrous portion of the temporal bone. The second, third, fourth, fifth, and sixth cranial nerves were all involved in the tumor mass as they escaped from the skull, and were easily identifiable at their exit from the growth.

A portion of the tumor had grown into the orbit, apparently mechanically pushing forward the eye ball; the contents of the orbit were not involved. A further projection extended downward through the foramen lacerum a short distance, and another about three cm. in length passed downward into the pterygoid fossa. This ended abruptly, and no connection could be traced between it and the mass in the neck.

No further growths were found on crosssection of the brain. The tumor was of a soft consistency, somewhat nodular, and reddish grey in color. The projection which escaped from the skull was firmer and less vascular than the intracranial parts. On the left side of the neck behind the sternomastoid a mass had been palpated coming from behind the mastoid process and extending downward for six or eight cm., like a tongue, broad above and tapering below. It was freely movable beneath the skin. The appearance of this mass when dissected out was that of lymph nodes matted together into a firm pearly grey tumor.

Histologically the tumor was difficult to classify, but the appearance most strongly suggested an endothelioma, primary in the lymph node and extending directly through the lymph channels or metastasizing in the skull. The tumor was composed of small round cells, showing in parts a distinct tendency to whorl formation, while in others it appeared unusually rich in ganglion cells. There was no marked perivascular infiltration, and the masses of neoplastic tissue showed no signs of necrosis. This appearance was not that of the typical endothelioma of the dura, but the alternative diagnosis of sarcoma of the middle fossa which not infrequently metastasizes into the cervical glands is inapplicable to the histological aspect of the growth.

CONCLUSIONS.

Our patient, a definitely luetic individual, showed paralysis of the left third, fourth, and sixth nerves varying in intensity from time to time, amaurosis of the left eye, sensory loss in the distribution of the fifth nerve with resulting neuroparalytic keratitis, exophthalmos, evidence of retrobulbar pressure, a mass in the neck and considerable edema of the palate on the left.

In view of the serological findings we at first thought that we were dealing with a gummatous meningitis and luetic infiltration of the pharynx. Antisyphilitic treatment, however, while giving the patient some relief, had no permanent beneficial results. Temporary improvement in cases of brain tumor as a result of specific therapy is well known. The unilaterality of the findings was rather against the diagnosis of luetic meningitis. This was therefore quickly abandoned and that of neoplasm of middle fossa advanced.

The question of localization was in doubt for a time in view of the impaired hearing on the left. The outcome of the Weber test, however, definitely pointed away from nerve deafness and in favor of a middle ear process. This in conjunction with the other findings led us to localize the growth in the middle fossa on the left.

The narrow pupil which Oppenheim noted in one of his patients, was also present in our case in spite of the third nerve palsy. We are inclined to ascribe this phenomenon to injury of the dilator sympathetic filaments which accompany the upper branch of the fifth nerve. It is probable that these fibres were injured early in the course of the disease, possibly simultaneously with the involvement of the fifth nerve.

The gustatory fits found their explanation in adhesion of the tumor to the inner side of the tip of the temporal lobe. So far as we are aware, such seizures have not been described in lesions of this region, though they have occurred from tumors growing outward from the pituitary. It occurred to us also in view of the atypical character of the tumor that we might be dealing with a neoplasm taking origin in the sympathetic system and following the course of its fibres along the vessels into the cranial cavity. The presence of ganglion cells made this suggestion a reasonable one, but there was not sufficient microscopical evidence to uphold it.

EPENDYMAL GLIOMA WITH THE CLINICAL PICTURE OF MIDDLE FOSSA TUMOR.[2]

Case II.—J. C., Italian, eleven years old, admitted November 13, 1921, to the service of H. B. Wilcox at Bellevue Hospital. The family history was negative. The child had had a normal delivery and development. The present illness began five to six months ago with attacks of headache lasting about one day and recurring once a week. The patient's condition remained unchanged for three and a half months. He then became bedridden. Three weeks prior to his admission to the hospital he became drowsy and had nose bleed; the right eye became bloodshot. Weakness of the right side of the face developed. There was no fever at any time. Three weeks ago at the onset of one of his attacks he was unconscious for a short time. His headache now was constant. There were no bladder or rectal symptoms. The boy had also complained of pain in the right side of the face and of double vision. The physical examination showed an emaciated, pale boy, with a dry skin. He was irritable and cooperated poorly. The right pupil could not be examined due to local conditions in the eye, the cornea being cloudy and the conjunctiva hyperemic. The left pupil was large and reacted poorly to light and accommodation. There was ptosis of the right upper lid and exophthalmos on the right. There was anesthesia in the distribution of the right fifth nerve and slight weakness of the right seventh, of the lower motor neuron type. There was limitation of ocular movements in the horizontal plane, more so on the right. The hearing was normal. The tongue deviated slightly to the right. Abdominal reflexes were normal. Knee jerks were absent, ankle jerks were present. No positive Babinski sign, although the left plantar response was at times equivocal. Kernig's phenomenon was absent. The spinal fluid was bloody and under increased pressure. The Wassermann test was negative in both blood and spinal fluid. The right fundus could not be seen. The left fundus showed slight congestion of the veins. There was generalized wasting with hypotonia. There was no ataxia. Sensation as far as could be tested was normal. The nosebleed was accounted for by an excoriation in the vestibule of the nose. There was no evidence of sinusitis. On November 17, 1921, there were generalized twitchings in the extremities. The spinal puncture was repeated, the fluid was still bloody and under increased pressure. The boy subsequently had a number of convulsive seizures, one lasting three minutes, the others of shorter duration. The x ray examination of the skull showed evidence of increased intracranial pressure, the coronal and lamboid sutures being pronounced. Erosion of the posterior clinoid processes was present. The floor of the sella was depressed. The urine was negative. The white cell count was 10,400, with fifty-seven per cent. polynuclear cells. The Von Pirquet test was negative. The patient was submitted to x ray treatment without benefit. Operation was refused. The patient died December 11, 1921.

The postmortem examination showed excoriation in the left side of the nose, right exophthalmos, and bronchopneumonia, probably terminal. The findings in the skull were as follows:

The calvarium was removed without difficulty, was somewhat thin and the dura stripped readily. The convolutions were somewhat flattened on both sides. At the base of the brain there was an irregular mass of material dark in color and very friable containing plaques varying in size, most of them about one mm. in diameter, which offer a somewhat gritty resistance to the knife. This tissue was spread over the brain stem, the pons and the pyramids and extended back to the cerebellum and into the interpeduncular space. Laterally it involved the basal ganglia, and the right lateral ventricle. The sella turcica contained a mass of granular tissue mixed with blood clot, which extends forward into the ethmoid cells on the left, but there was no communication with the nasal cavity on the other side. There was marked erosion of the sella, also of the torcula and small areas of erosion were noted over each temporal bone. There were one or two areas on the lateral surface of the cerebral hemispheres, remote from the main growth which were neoplastic in appearance.

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[2] Report presented at the meeting of the New York Neurological Society, January 3, 1922.

The right orbital fossa were somewhat large. On dissection of the right eye ball it was seen to contain an increased amount of vitreous humor; otherwise it appeared normal. The histology of the tumor was that of an ependymal glioma.

The dominant findings in the case were those of middle fossa lesion on the right. (Ocular muscle palsy, anesthesia in the distribution of the fifth with resulting neuroparalytic keratitis and conjunctivitis.) There were slight evidences of extension of the process posteriorly (peripheral facial palsy and slight deviation of the tongue). There was also an apparent lesion of the internal fibres of the third nerve on the left, but it is still to be noted that the findings outside of those pointing to the involvement of the right middle fossa were meagre indeed when one considers the widespread character of the lesion. It is worth emphasizing that there was no evidence of choked disc. This may have been due to the yielding of the sutures noted in the x ray report. That the intracranial pressure was increased was shown by the x ray findings, the increased tension in the lumbar fluid, and possibly also the diminution of the knee jerks. The last is commonly seen in cases of hydrorhachia. The alternative explanation for the diminution of the patellar reflexes, that of possible injury to the cerebellar pathways, could not be demonstrated, although there is noted hypotonia of the musculature. The bleeding from the nose on the right side led us to consider for a time cavernous sinus thrombosis, but this diagnosis was rapidly abandoned. The protrusion of the right eye ball was not adequately explained by the autopsy findings, but it has been noted very frequently in intracranial tumors and may be due to irritation of the sympathetic filaments which innervate the so-called Landstroem muscle surrounding the eye ball.

We are indebted to Dr. Douglas Symmers, director of the Bellevue Laboratories, for his courtesy in placing the pathological material at our disposal.

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Hysteria After Mastoidectomy Simulating Brain Abscess*

Cerebrospinal Rhinorrhea in Same Patient

By ELLIS M. SCHWARTZ, M.D.,
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Case.—Patient E. A., aged twenty-four years, single. The family history was negative. The patient had had fourteen admissions to various hospitals and seven operations. One of these was an operation on her right mastoid about four years ago. Four days after operation she had a spell of vomiting with signs of hemiplegia. The hemiplegia cleared up but the vomiting persisted. A brain abscess was suspected but all the symptoms disappeared before operation, and she left the hospital after an uneventful recovery.

The patient was admitted to the hospital on August 16, 1921, complaining of severe pain in the left ear and over the mastoid process. Her temperature was 99° F., pulse 100, respirations 22. The ear drum appeared congested and was slightly bulging. It was incised after which there was a slight discharge from the ear, but no relief to the patient, and she groaned and moaned constantly for a few days. The tenderness over the mastoid appeared aggravated. Her blood count was 11,500 white cells, seventy-five per cent. polymorphonuclears and twenty-five per cent. lymphocytes. We operated, but from the symptoms presented we expected to find more involvement than appeared. There were, however, many cells which were diseased and the mastoid process was cleaned out thoroughly.

On the tenth day following operation the patient had several convulsions, rolling of the eyes and fell into coma which lasted for forty-eight hours. She began to vomit and this lasted for several days. Her temperature had not gone up and her pulse was the same as before the operation. Her urine showed a trace of acetone probably due to the vomiting and starvation.

A spinal puncture was made and the fluid came out at the rate of forty-five drops a minute. It was negative in all other respects. The cerebrospinal fluid Wassermann was also negative. Her pupils were equal, reacted to light and accommodation. There was corneal anesthesia present. The visual fields were also diminished. There was complete pharyngeal anesthesia. The heart and lungs were examined and found negative. Nervous reflexes such as knee jerks, Babinski and others were also negative. The vomiting became more marked. The house surgeon gave her a hypodermoclysis and he impressed upon her that more were coming should she vomit any longer. The vomiting stopped for a day. Then it returned and after a lavage and one more hypodermoclysis with the threat of more to follow, vomiting ceased and she retained all food.

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*Presented before the People's Hospital Clinical Society, November 9, 1921.

When she was able to sit up in bed she complained of headaches and dizziness. She held a handkerchief under her nose constantly and on close questioning we learned that five months prior to the mastoid operation there had developed a rhinorrhea. There was a constant dripping of clear fluid through her nostrils when she was sitting or it would gravitate down her throat when she was on her back. There was neither a history of a cold nor an injury. The fluid could be easily collected in a test tube when she held her head forward. It was examined on several occasions and found to be cerebrospinal fluid. Her mastoid condition improved all the time, and she left the hospital on September 18th, and reported regularly for dressings. The last time I saw the patient the mastoid wound was practically healed, but the rhinorrhea was still present. X rays were negative, they showed no necrosis of bone. We were unable to locate the spot through which the fluid came.

CONCLUSIONS

Until 1899 all cases of rhinorrhea were regarded as nasal until St. Clair Thomson described the escape of cerebrospinal fluid from the nose. The subarachnoid fluid under conditions not yet demonstrated has been found to escape through the nose without apparent harm to the patient. The fluid is clear and watery and so differs from the slightly opalescent nasal hydrorrhea. The general belief is that it is due to an increased intracranial pressure and that the fluid escapes through the cribriform plate.

There are no means of treating such cases on record. The only possible thing to do is to be careful to avoid infections of the nose so as not to spread it to the meninges.

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The Origin and Scope of the Modern State Hospital

By CLARENCE A. BONNER, M.D.
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In this paper it seems advisable to turn back the pages in the history of insanity that we may get a brief glimpse of the customs of earlier times. Then the country itself was in its infancy and insanity was merely an interesting occurrence in a few persons. By the early settlers these unfortunates were retarded as being "afflicted with an awful visitation from Heaven and that no human agency could reverse the judgment by which it was inflicted." Thus since it was the act of God there could be no appeal nor hope for relief. At first the problem of the insane seems to have given little concern, but as time went on it demanded more and more attention.

There is little knowledge available and few references are made to the dependent insane in the early laws of the colonies. They were classed as paupers. but regarded as special objects of charity. It is convenient, from a historical viewpoint, to begin with the year 1639, at this time the first reference to any laws of settlement in Massachusetts, which included the insane, is found. The power to determine the responsibility of caring for any person requiring public relief was given to the General Court or to any two magistrates out of Court. In 1645 provisions were made by law which specifically arranged for the disposition of the insane, then referred to as impotents. At a little later period it was enacted that three months quiet, undisputed residence also gave a settlement and made the town responsible for the care of such individuals who were mentally distracted. We may infer from the above, that at this period, the wandering insane were first making their presence felt and the question of residence had been brought to the attention of the public.

The earliest actual legislation in relation to the insane was enacted in Massachusetts in 1676 which delegated to the Selectmen of a town the care of the person and estate of the dependent insane. Just twenty years later an act was passed bearing the title, For the Relief of Idiots and Distracted Persons. This assigned the care of the insane to the Selectmen, but awarded the disposition of their property to a Justice of the Peace.

The next date of importance was 1736 when a law was provided which gave power to the Judge of Probate to direct an inquisition as to the sanity of a person. This was to be performed by the Selectmen, thus the first record for the procedure of a mental examination. About fifty years later an act was passed providing for the guardianship of an insane individual. In 1798 the law permitted the furiously mad to be committed to the House of Correction where they were confined with criminals, producing a most distressful condition.

At this point it might be well to interpose a few words describing the general care of the insane. Most of us can readily imagine the torture inflicted because of erroneous opinions and lack of facilities. Following are a few illustrative cases taken from early records, which, so far as we know, would be applicable to any part of the country at that time.

CASE I.—A male who for twenty-eight years had been in prison, and for seven years had not felt the influence of fire and many nights had not lain down for fear of freezing. During all these years he had not been shaved, and had been provoked and excited by hundreds who were brought to view the exhibition of his ravings.

CASE II.—A male who had been in prison fourteen years. He was naked, hair and beard had grown long, skin so filled with charcoal it was impossible to determine his nationality. Accustomed from his place of durance to annoy the entire neighborhood by his loud screams, he was regarded as a most desperate lunatic.

CASE III.—A male, seventy years old, who had been chained twenty-five years and during that time the chain had been removed but once.

CASE IV.—A male who had been ten years without clothing, a most inconceivably filthy and degraded being, exceedingly violent and outrageous.

CASE V.—A female very filthy in her habits, had not worn clothes for two years, during which time she had been confined in a filthy cell, destitute of everything like comfort.

CASE VI.—A female who had been confined with a chain so short that she had wholly lost the use of her lower limbs, and was unable to stand or walk.

The feeble and helpless were boarded out to the lowest bidder. The others were allowed to wander about exposed to all sorts of hardships and not apprehended unless violent or destructive, when they were placed in specially prepared cages, pens, county houses or jails. The practical definition of insanity in those times seemed to apply to that class of persons who were violent and required custody to prevent them doing injury to themselves or their neighbors. Gradually in the community, due to the everincreasing population, the care of the insane became an insurmountable problem, demanding that the people as a whole must intervene and arrange for the custody and treatment of these unfortunates. Thus the plan of establishing State hospitals for the insane was evolved.

To Virginia belongs the honor of establishing the first State hospital designed exclusively for the insane. It had the impressive and lengthy title, The Public Hospital for Persons of Insane and Disordered Mind, now called the Eastern State Hospital of Williamsburg. It was incorporated in 1768, a board of trustees appointed, provisions made for building and maintenance, as well as rules for admission. At this hospital the medical care was confined to a nonresident physician who had no responsibility to the keeper who was in direct charge, and no definite medical treatment was attempted. In Massachusetts the McLean Hospital received its first patient in 1818 and the Worcester Lunatic Asylum was established in 1833.

At this juncture it seems pertinent to mention the name of Dorothea Dix. She was born in 1802 in Hampden, Maine. Due entirely to her own efforts she secured an education equal to the best offered at that time and at nineteen established a private school in Boston which became famous. Later she undertook her public spirited work, first with prison reforms, but soon devoted her entire time and energy to bettering the condition of the insane. Her work began about 1841 when she pleaded that a few insane who were confined in bitterly cold rooms in the House of Correction be given heat and care.

She immediately met with opposition and this sentiment stirred her to further investigation. She began personally to inspect all buildings where the insane were kept and found unspeakable conditions. Enlisting influential aid she was enabled to present her famous Memorial to the Massachusetts Legislature, this was a powerful plea to correct the care of the insane. Finally passage of the Hospital Bill was secured which remedied the situation by providing suitable housing facilities for the insane apart from the criminals and the criminal insane.

Following her success in Massachusetts she entered other states and secured reforms, always fighting for the cause she represented, but never yielding her spirit no matter how great the opposition. In 1855 she visited nearly all the countries of Europe, where she received a favorable reception and succeeded in bringing about needed reform. Always in poor physical health, yet she lived and worked until her eighty-fifth year when she died after a life unselfishly devoted to the welfare of the insane.

The organization of the Utica State Hospital in 1843 marks a real point of progress. Here we had an institution built by a state on an extensive and liberal scale, properly officered with physicians and with definite rules of admission and discharge. The insane were withdrawn from various places of detention and given the care which was essential. A wave of enthusiasm swept the country at this time. It was thought that a few months' treatment in an asylum, vigorous and intensive, would serve to cure. Numerous other hospitals made their appearance, all under the assumption that the discharge would be rapid and that all cases would be cured. This enthusiasm soon spent itself and the hospitals soon returned their socalled incurable patients back to the almshouses and homes to make room for new admissions. The reaction was tremendous, but standards of care became better and the necessity for a permanent custodial institution to care for the chronic cases was recognized.

Shortly after the Civil War, the New York State Medical Society became interested in this branch of medicine and appointed a committee of three, who in turn appointed a physician from each locality to investigate and report on conditions in the part where he lived. This report showed such neglect and improper treatment that a law was passed sanctioning the building of a large socalled chronic institution at Seneca, the scheme now was to care for the acute cases at Utica and after a certain period of observation to transfer the delayed cases to Willard. This was a move of great importance, and destined to be further and more widely adopted.

In the year 1896 in the city of Munich, Germany, a psychiatrical clinic was established. A building of a hundred beds in 1905 totalled two thousand admissions which were quickly distributed to other centres, none but the manifestly rapidly recoverable cases being held, or those for demonstration purposes. With this institution was associated such names as Kraeplin and Nissl. The State Psychopathic Hospital for Michigan in affiliation with the university was placed in operation in 1906, and the Boston Psychopathic Hospital in June, 1912.

The present methods and manner of caring for the insane were not attained over night, but are due to the gradual transition of years. They represent progress, slow but sure, until today we can feel that we are living in an era where certain plans and ideas, relative to insanity, may be carried on.

To the future then we may look for an ever-increasing field of usefulness in our chosen work, an inspiration which may help us attain new procedures in the treatment of the insane. But before treatment, in the light of present day activities, may we not think of prophylaxis. With satisfaction one may look back to the names of those who have preceded and who devoted their lives to the problems which are before us today. In the light of their achievements can we afford not to add our bit to their accomplishments? One step at a time but surely a progressive step.

Many drugs have been advocated as suitable to relieve the various mental symptoms, but few have stood the test of time and usage. To mention a few of the conditions and the remedies applied may be interesting. Benjamin Rush taught venesection as a remedy for the relief of maniacal excitement and this procedure was carried out for years before it was observed that the impairment of the physical health, due to the operation, lessened greatly the chances of recovery even in the most favorable cases. As bleeding fell from grace sedatives, emetics and active carthartics were substituted, in fact, nearly every drug had its day in correcting each and every symptom. We find mention of almost every agent from calomel to camphor in the drug therapy of the past. Hyoscine enjoyed a long period of active use and in the markedly disturbed cases is still a valuable agent. Arsphenamine is as valuable to the neurosyphilitic clinic as it is to the syphilologist and luminal is especially valuable in the severe forms of epilepsy.

With careful and competent nursing the warm and continuous baths serve admirably and obviate the necessity of drugging and there are other hydrotherapeutic measures of equal value. Electrotherapy is a valuable adjunct to the above methods of treatment. As to the efficacy of glandular extracts much is to be learned of their action as applying directly to psychiatry.

One phase of treatment which is perhaps the most difficult to attain in our State Institutions is the opportunity for individual and intensive study of each case. This is due to the pressure of many other necessary duties. We often learn of self-unravelled conflicts at too late a date. There is no telling how much mental suffering could be relieved if more time were permitted for individual study for each case.

Occupational therapy is the sovereign relief for the disordered and unoccupied mind. The earliest hospital records make mention of it and its value even then was recognized. As the years have passed, specialists, in directing this branch, have been developed. Intelligent supervision of systematic industry for patients will accomplish wonderful results. On the other hand a conglomeration of all types, placed in one room together, regardless of fatigue or training, is unscientific and nonproductive of good results. Ward classes are invaluable and suitable to those who cannot be readily moved to a central meeting place. Even the demented patient is susceptible to training and reeducational work is very interesting and well worth while. Finally, in passing, mention should be made of the value of creating within a homelike atmosphere. This is accomplished by means of colorful decoration and changing the prosaic and stern architecture of the furnishings of the past generation. Individual liberty within reasonable limits and the amusements also serve a most important and helpful function.

Marked Atrophy in Early Tabes

By HERBERT LEIGHTON FOSSEY, M.D.,

Philadelphia.

Case.—The patient, a young white man, thirty years of age, was admitted into the Philadelphia General Hospital, August 23, 1921, complaining of gastric pains, vomiting and urinary incontinence. The patient appeared to be very sick. Physical examination revealed a severe form of cystitis, pyelitis and infected penis due to continuous friction of the urinal. He was suffering intensely from the pains of gastric crises and persistent vomiting which had been present for the past six weeks. Two weeks prior to entering the hospital he had been operated upon for appendicitis, but with no relief from the symptoms.

He presented the typical syndrome of tabes dorsalis. The findings were briefly as follows: 1, Sharp shooting pains in the extremities; 2, vesical and gastric crises; 3, Argyll Robertson pupils; 4, anisocoria; 5, patellar reflexes absent; 6, positive Romberg and ataxic gait; 7, increased sensibility to external stimuli; 8, extreme hypotonus and most marked atrophy of all muscles, particularly of the lower extremities; 9, in the lower extremities the posture and the tactile discrimination sense were impaired; 10, history of chancre.

These findings and a four plus Wassermann in all antigens in the spinal fluid and a typical luetic colloidal gold curve, made a diagnosis of tabes certain. I might say here by way of parenthesis that the blood Wassermann was negative in the Noguchi and luetic antigens.

The most striking objective finding in the case was the extreme atrophy in so young a patient and at so early a stage of the disease. The disease was of four years' duration and the symptoms started one year after the initial lesion. He had never been sick before, had been in the Navy, and had been a large boned, well developed, strong, healthy young man. Truly this must have been an unusually virulent type of spirochete.

On looking up the literature on this subject I found it sparse indeed. Dejerine mentions the tabetic type of neuritic atrophy which may be confused with tabes. Lapinsky speaks of an initial neuritis in young people which gives marked early muscular atrophy. According to Marie, tabetic muscular atrophies may be divided into two groups: 1. Those appearing at an advanced period of the disease presenting a symmetrical distribution, rarely marked by fibrillary twitchings. 2. Those occurring oftener in the early stages of the disease, usually unilateral in distribution, marked by fibrillary contractures and sometimes by the reaction of degeneration. The first group embraces those atrophies confined to the distal portions of the lower or upper extremities and recalls the conditions found in multiple neuritis. The second group contains lingual hemiatrophy, localized atrophies of the shoulder, of the back, of the hand, and one sided involvement of the cranial nerves. They are analogous to lesions of the gray matter. Both the central and peripheral lesions are found, and in the associations indicated above. The wasted muscles present the usual histological change, due to degeneration in the lower motor neuron. (Church and Peterson).

In an excellent translation by Dr. Winkleman of an article by the German writer, Herman Lippman, Concerning Muscular Atrophy in Tabes Dorsalis, the author states that, "Lapinsky and others have found that section of the posterior root causes changes in the cells of Clarke's column and in the nerve cells of the anterior horn, changes which in their essentials consist of a swelling of the bodies and loss of Nissl bodies." From this viewpoint he explains the atrophy in tabes.

In general two theories oppose each other; one by Dejerine and the other by Lapinsky. Dejerine thinks that the muscular atrophy of tabes depends on a neuritis of the peripheral nerves, especially, and proceeds slowly to the anterior roots. These changes in the nerves indicate a proliferation of the endoneural and perineural connecting substance. The muscles which these nerves supply have thin round fibres which in portions fall apart and are filled with pigment. The connective tissue in these muscles is increased and rich in nuclei, the fibres thin and few. Clinically, there is atrophy of the extremities fairly symmetrical. The spread indicates branching of the nerve trunk. Fibrillary twitchings are not observed; the reaction of degeneration is frequent. Dejerine is of the opinion, because of these findings, that tabes at times locates in the peripheral motor nerves. It has not as yet been proved that this is due solely to tabes. The clinical and pathological findings are the same whether the neuritis is due to poisoning or to a mechanical injury. It has been known for a long time that in tabes as in alcoholism, the motor nerves are vulnerable. Any toxin which a normal person can withstand may injure the nerves of an alcoholic or a tabetic person. Leyden, Remak, Moebius, and others are of the opinion that in tabes there is a tendency to paralysis because through the degeneration of the posterior roots the impulses do not reach the anterior horn cells. The resistance of these cells is decreased, and they are easily injured.

A further objection to the theory of Dejerine is that in his studies he used the older methods of staining, and the author believes that the newer methods of staining, especially the cell stains (Nissl's) are necessary to determine the entire picture, especially as regards the anterior horn cells. Lapinsky himself found no changes with the older staining methods but he found them with the newer ones. The author also opposes the newer views of Dejerine that the changes in the anterior horn cells are the result of axonal degeneration and closes his discussion by stating that there are no good grounds for blaming these changes in tabes on a tabetic neuritis. Lapinsky is the leading exponent of the theory that the change is primarily in the anterior horn cells. With Nissl's stain he found in serial sections these changes in the cells: the cells were swollen, the Nissl bodies in part were grouped around the nucleus. The nuclei were likewise swollen and altered in their shape and sometimes peripherally placed. Various peripheral nerves and muscles showed degenerative changes which had their origin in these cells. Clinically, there were various differences from the neuritis of Dejerine. The localization of the atrophy does not indicate a distribution of the nerve trunks, since some muscles were only in part atrophied, and in the same muscles normal bundles were near the involved ones. There was no symmetry in the affected muscles. The author concludes that muscle atrophy in tabes occurs under these conditions: 1. Accompanying disease. 2. As a result of the general weakness and anesthesia of the muscles toward the end of the disease. 3. As a result of the peripheral neuritis brought out, not through the poison of tabes, but through other injurious processes. 4. As a result of the localization of the specific trouble of tabes in the nerve roots and anterior horn cells, whereby the motor impulses are more or less impaired.

William G. Spiller showed me sections of the spinal cord of the patient under discussion, which he made himself, and the findings are as follows: The spinal cord shows the usual degeneration of the posterior roots seen in tabes, and this degeneration is very intense in the posterior roots of the lumbar region and even in the midcervical region. The nerve cells of the anterior horns of the lumbar region show considerable degeneration of the type of central chromatolysis, that is, a disintegration of the chromatophilic elements particularly of the centre of the cell body with peripheral displacement of the nucleus. This is a common finding in multiple neuritis and would indicate that the peripheral nerves were considerably degenerated. The nerve cells of the anterior horns of the midcervical region show a similar reaction at distance but not so intense. The nerve cells are possibly not so numerous as one would expect. Intense degeneration of the posterior roots from the upper limb with some central chromatolysis of the nerve cells of the anterior horns indicate that a similar degeneration of the peripheral nerves was present in the upper limbs. Such widespread degeneration of the posterior roots is uncommon in tabes of such short duration and the process had reached a height which is usually seen in tabes only after much longer duration. The action of the spirochete in this case must have been exceptionally virulent, producing within a short time lesions uncommon at so early a period, explaining the early muscular atrophy.

Editorial Articles

HIGH LIGHTS.

William McDougal, writing in the *Journal of Abnormal Psychology and Social Psychology* for December, 1921, March, 1922, has much to say about instincts that is worthy of study. He takes up the more serious of his opponents to the theory which he defends, e. g., that the instincts are definitely associated with affective states. McDougal has made some light modification in his original statements and to the test tube psychologists he will appear even more radical than before.

Most interesting of all is the straightforward attack which he launches at the sterile psychology of the past. He does not mince words but assails the psychologists who never stir beyond their own domain and who grow petulant when any dynamic concepts are proffered. Their narrow concepts have so bound them that they do not dare admit they have been following arid pathways over deserts. Unfortunately many of these psychologists who oppose every potent theory hold positions of trust in a number of our leading universities.

McDougal, in support of his stand, quotes from an article by Wheeler, one of the most stimulating, by the way, which has appeared in recent years. "After perusing during the past twenty-five years a small library of rosewater psychologies of the academic type and noticing how their authors ignore or merely hint at the existence of such stupendous and fundamental biological phenomena as those of hunger, sex and fear, I should not disagree with, let me say, an imaginary critic recently arrived from Mars, who should express the opinion that many of these works read as if they had been composed by beings that had been born and bred in a belfry, castrated in early infancy, and fed continually for fifty years through a tube with a stream of liquid nutriment of constant chemical composition." This about some of our anemic braggarts who lose themselves in a whirl of data and refute dynamic psychology, spewing forth venomous streams of fury when they hear the name of Freud. It is refreshing.

Then McDougal has something to say for himself. ". . . I would emphasize the fact that the whole of Freudian psychology, and the analytical procedures founded upon or allied to it, assume the essentially purposive or teleological character of mental life, and are absolutely incompatible with the notion that human nature comprises no innate factors beyond a multitude of mechanistically operating reflex arcs." He goes on to say that while he cannot accept the Freudian psychology completely yet "its worldwide spread and the success in many instances of the procedures based upon it, suffice to prove that it contains much truth and that its fundamental conceptions are not to be destroyed by the deductions from first principles of academic psychologists, whether of the laboratory or arm chair schools."

In reply it may be said that progressive psychopathologists value highly the extremely valuable contributions of McDougal, yet there are minor points of disagreement. But one can discuss matters in an intelligent fashion with McDougal. This cannot be said of the single track psychologists who warm the seats of learning in many of our educational institutions. McDougal is alert, ready to change when he sees a better way. The old guard psychologists remain in their ruts, a band of mutual admirers rushing to each other's rescue at the first sign of change or departure.

Active psychopathologists of the modern school will greet the contributions of men of breadth like Wheeler and McDougal. They are to be commended for their contributions, for their valor.

FREUD IN REGARD TO TELEPATHY.

It is the scientific mind of broadest scope that is least in haste to reach or to state dogmatic conclusions. It guards itself against following mere desire to believe, which leads the lesser mind so rapidly to its positively expressed conclusions. It might be assumed that Freud might have reached a position in the knowledge of psychic facts which would permit him to speak authoritatively upon the important question of occult telepathy. Yet it is Freud who also has come to know man's psychic nature in the light of wish tendencies and thus to discount a mere desire to believe in the phenomena of occult telepathy since he cannot lay claim to knowledge of conclusive details. Neither, on the other hand, does he allow the wish to appear as an authoritative guide in the things of mind to lead him to pronounce dogmatically against a belief in telepathy. He merely speaks of it with the simplicity of the careful seeker for truth only in so far as facts slowly reveal it. "I have no opinion, he says, I know nothing in regard to it."

Yet Freud does place before his readers (*Traum und Telepathie: Imago,* Vol. VIII, No. 1, 1922) facts from the field with which he is familiar which have some bearing upon phenomena which are called occult and telepathic. Setting them forth as he does in their actuality in dream construction these facts at least serve to clear the mind of certain hasty misconceptions regarding the occult. They do so in large part from the distinction that reveals itself in the manner of considering phenomena. On the one hand there is Freud's calmer, broader consideration of the facts in the situations, facts not easily evident without careful thought, and without knowledge of the ways of the unconscious. On the other is that imperfect method of seizing a few salient points and leaving out of account the larger number of seemingly unimportant details which if considered are enough to overthrow all the first conclusion. This is the way in which men ordinarily think and thus do Freud's correspondents submit to him the material which they offer for consideration.

One of these individuals presents a dream with its associations which seems to record a striking telepathic announcement made through the dream. The latter, with its meagre associations, passing under Freud's closer scrutiny fails, however, to accord sufficiently with the actual occurrence to furnish telepathic testimony. But it does reveal so much disguised wish phantasy of a forbidden nature that it shows itself most clearly as similar in its content and mechanism to the ordinary analyzed dream. The same may be said of the second dream examined, a recurrent dream of another correspondent, which is reported together with a seeming telepathic experience in the writer's life. The latter experience again suggests a possible explanation upon the ground of forbidden wish phantasies revealed by the dream and by other reported phantasy experiences. Therefore Freud concludes that his material, while it conforms to the psychoanalytical knowledge of dreams, adds nothing as to the fact of telepathy. Since the dream work is so distinct and evident a thing in itself he does not believe that telepathy can add to our knowledge of it. Yet if dream analysis can thus reveal the background of the psychic life psychoanalysis should be able to further the study of telepathy. Telepathy, he well points out, if it exists, can only come into contact with the dream as any other external factor such as a disturbing noise may enter the dream activity.

It is striking that Freud himself can report no telepathic dream from his own experience nor from that of the many "highly sensitive" people whom he has analyzed. He states that it is true that he himself has dreamed of startling events, such as are recorded in telepathic experience, but the dream forebodings never proved themselves true. Reality failed to correspond to them and they found their explanation by dream analysis.

THE NEWSPAPER AS A MENTAL HYGIENIST

"The ideal of mental health and the ideal of the newspaper are properly the same. Truth is the ideal of both. Mental ill health is invariably associated with a variation from truth. It is not necessary that a person have delusions, hallucinations, or fixed ideas in order to depart from the truth. Truth involves every phase of life—physical, intellectual, and emotional, to use an old classification. The mental attitude of a person affected with a phobia or a psychoneurosis is by that fact so directed to one aspect of life—and not infrequently an aspect of life that is no longer of race service—that he fails to preserve a proper balance with reference to the other aspects of life, which invariably are more important. Every mental disease, however slight, involves in some measure a distortion of the truth." Thus writes Nelson Antrim Crawford, professor of industrial journalism at Kansas State Agricultural College, in a most enlightening and suggestive article, Mental Health and the Newspaper, published in the April number of *Mental Hygiene.*

Professor Crawford feels that the American people as a whole are beset with a form of psychopathological fear, not a physical fear, but an intellectual and spiritual fear, taking its form most conspicuously in fear of and deference to the herd, the whole body of people. "The newspaper, as at present constituted, is essentially a herd institution. And the herd in the United States is a very closely massed formation, held together by a great body of beliefs and taboos. One of its most marked characteristics is fear of and hostility to new ideas. The American public does not want facts; it wants only pleasant facts. The newspapers, generally speaking, defer to the American public's fear of ideas. The herd fears ideas; the newspaper fears the herd; therefore, the newspaper fears ideas. Thus is established a vicious circle of psychopathological fear." This fear on the part of the newspaper is sometimes justifiable. The herd manifests its displeasure by dropping subscriptions, stopping advertisements, writing disapproving letters, and in many other ways. Many newspapers consciously cater to this fear of new ideas on the part of the public by suppressing, distorting or coloring facts so that they create erroneous impressions, a procedure totally at variance with all the ideals of democracy in America. "If the newspaper is to be what it should be, in accordance with its ideals as an organ of the truth, it must, where necessary, resort to expert interpretation, being careful that such interpretation is just and unbiased. The newspaper resorts regularly to interpretation—not always expert, however—of political and economic problems. It resorts to expert interpretation of scientific matters related to industry. Unfortunately, it almost never employs expert interpretation of psychological and psychiatric problems. By resorting to expert interpretation of these problems, it could educate the public to an understanding of many abnormalities that are a constant menace, but concerning which the average reader has no dependable knowledge." It is a prevalent belief, for example, that habitual crime is due to intellectual ignorance, while as a matter of fact it is due in large part, if not entirely, to organic or functional mental disease. "The cure must be prescribed by the psychiatrist rather than by the educator." These psychological disorders will never be cured until the public understands them, and the newspaper, being the only reading matter of the general public, will have to give it this understanding.

But ignorance on the part of the public concerning sex and sex crimes creates probably the most dangerous situation from a criminological point of view. People feel a natural repugnance toward the unnatural or abnormal, and see in sex crimes evidence of wilful moral guilt. Yet sex crimes are almost invariably, if not invariably, the results of definite, recognized psychopathies, curable neither by imprisonment nor by any other form of punishment. "The mob that lynches a prisoner for a sex crime merely bears witness to a sexual aberration of its own. There is a strong sadistic component in the mental life of the race, and the members of a lynching mob are simply giving vent to this psychopathological condition in themselves. . . . When the people once understand such psychopathies, however, they will take sensible steps, through greater care in breeding, to prevent psychopathic inheritance; they will be solicitous as to the early life of children; and when psychopathic conditions do develop, they will handle them from the point of view of science and not that of the ignorant rabble."

The writer summarizes his discussion as follows: "To sum up, the newspaper has the same ideal as the seeker for mental health. That ideal is truth. The newspaper can aid in the establishment of higher standards of mental health in the nation, first, by interpreting to the people the mental diseases that predispose to crime or other antisocial activity; secondly, by aiding, both through precept and example, in the elimination of those pathological fears that are so marked and sinister a characteristic of American life."

THE SYMPATHETIC AND ENDOCRINE GLANDS

Much attention has been given of late to the relationship existing between the sympathetic nervous system and the endocrine glands. Regardless of a rather general tendency at present, there is reason to be reserved in respect to this subject.

It is quite true that from the viewpoint of embryology and anatomy such a relationship is undeniable and the multiplicity of the nerve filaments of the sympathetic supplying these glands is a fact easy to observe. On the other hand, experimental work and pathological findings only go to reinforce this opinion. The action of the glands on the sympathetic is unquestionable, because they act by their hormones thrown into the circulation. Every organ innervated by the sympathetic will, for example, be influenced by adrenalin; the action of the hypophysis on the circulation is patent, although occasionally disconcerting. On the other hand, the influence of the sympathetic on the glands is very probable; stimulation of the sympathetic causes changes in the state and functions of the thyroid, while stimulation of the fibres ending in the hypophysis determines polyuria with glycosuria.

In another order of facts, the changes arising in the organism at puberty and the menopause likewise appear to show a certain interdependence of the sympathetic and endocrine glands. At each of these epochs the changes occurring in the functions of the genital glands are accompanied by almost pathological phenomena which indicate an involvement of the sympathetic reacting notably on its vasomotor ramifications.

From the viewpoint of pathology, there are other indications showing this interdependence. In Addison's disease there is a lessened excitability of the sympathetic and a decrease of the tonus of the organs it supplies. In exophthalmic goitre an entire series of symptoms develop which are, on the contrary, the expression of a rise of sympathetic tonus.

But regardless of the multiplicity of data of this kind, the question is far from being solved. One may affirm the relationship between these two systems and suspect its importance, but for all that it cannot be completely demonstrated. While certain glands, the suprarenal for example, are closely associated with the sympathetic, others, like the thyroid, appear less intimately united to it, while still others, like the testicle, possess unquestionably a very great autonomy. Although it is known that the endocrine glands react on each other and mutually equilibrate themselves, it has been pointed out that this is brought about by the intermediation of the vegetative systems. These are reasonable and perhaps true explanations, but when all is said, they do not rest on any proof.

It is quite comprehensible that the solution of such a vast problem should in part escape us. In point of fact we are dealing with glands which secrete, although we are partially ignorant of their products of secretion, and a nervous system which functionates, although its action has not as yet been controlled experimentally. We should not allow our imagination to bring us to hasty or fanciful deductions. The physician should only note the clinical data observed, whether these be simply in the domain of pathology or the consequences of pharmacodynamic interferences. Thus instructive data may be obtained susceptible of reaching interesting therapeutical conclusions which will permit him to act on the sympathetic system, the endocrine system, or on both at the same time. To attempt to reach the bottom of phenomena is the business of physiologists.

AMEBISM OF THE NERVE CELLS

Recent observations have thrown new light on the mechanism of nervous acts whose explanation has become evident now that a continuity between the nerve cells has been demonstrated to exist. It is constant and unchangeable. The theory of nerve cell amebism gives a clearer understanding and offers a satisfactory explanation of both normal and pathological physiology and psychological data. Thanks to amebism, the unity of the results obtained by so many different factors are also easily explained. The ameba retracts its pseudopodium when in repose or from physical or chemical stimuli. The neuron reacts in the same way to an external stimulus, such as narcosis, or chemical or bacterial poisons and fatigue, isolating itself by withdrawing its dendrites uniting it to the surrounding neurons.

Long since, Lépine, of Lyons, happily applied nerve cell amebism to the pathogenesis of motor, sensitive and sensory paralyses of hysteria. These are due to the isolation of the neurons by breaking off communication with each other by disconnection of their dendrites whose continuity is necessary for normal conduction of nervous stimuli. The action of nerve poisons can be explained in the same way, according to Morat, even when given in minute doses. The disproportion between the cause and effect—the marked effect produced by an infinite quantity of toxic substance does not belong to the ordinary laws of chemistry. It can be understood if it is noted that each nervous organism is composed of numerous very small wheels within wheels, and if one of them becomes momentarily incapacitated the effects produced are all out of proportion to the cause.

Nerve exhaustion is explained by Maurice de Fleury as an incomplete retraction of the dendrites of the cells of the gray cortex, a result of an hereditary predisposition and mental strain. It is not an absolute relaxation but rather hypotension of the semivitality; the muscles enter into a state of hypotonus while at the same time the glands decrease their output of secretions and the nutrition languishes.

Tanzi explains the effects of education and habit by a slow progression of the nerve cell dendrites resulting in a more ready and intimate contact between them, and this theory explains the secondary automatic acts which first require the action of the will but afterwards are accomplished without intervention of consciousness. Education causes the dendrites to direct their branches in new directions resulting in new contacts.

After a certain age the mind receives new impressions with difficulty even when presented in an evident and demonstrative form. Old age offers every possible example of this defective mental plasticity which is the outcome of organic transformations. The contractility of the protoplasm becomes weaker and the movements of the nerve fibres are sluggish. The established contacts are easily accomplished while new associations are formed with great difficulty.

Mental affections and cerebral symptoms observed in various affections are susceptible of the same interpretation. The incoherence of ideas, obsessions, etc., can be explained by a more or less considerable permanent or temporary change of the nerve cell, caused by a modification in the chemical makeup of the protoplasm resulting from chemical or bacterial poisons and produce more frequent contact—abnormal or continued — between the irritated neurons which react like an ameba when placed in some toxic solution.

Finally Le Dantec sought to explain the personality and its variations by the correlation existing between the structure of the nervous centres and the personality itself. During sleep there is doubling of the nervous system by retraction of the cell prolongations and consequently there is no continuity of psychic life. But in the morning the personality returns because the same epiphenomena of consciousness are always accompanied by the same physiological phenomena.

The theory of amebism certainly will advance our knowledge of the mechanism of the functions of the normal or pathological nervous system, but it offers no explanation of the psychological mechanism and the theory of the *nervi nervorum* only complicates the problem without solving it. These theories are advanced by workers who attempt to explain mental phenomena on a mechanistic basis. They endeavor to throw the psychical into limbo by ignoring it. These futile efforts have been attempted under less scientific guises for centuries and have added much rubbish to our medical literature.

WISCONSIN'S MENTAL DEFICIENCY SURVEY.

In the public schools of Wisconsin, it has been estimated, there are 40,000 children of the 400,000 in attendance who are in need of training more specialized than can be given them in the regular grades. This fact is among the findings of the survey of mental deficiency in Wisconsin, a report of which has recently been issued by the Advisory Committee on Mental Hygiene appointed by the Governor. This survey was undertaken, at the request of the Wisconsin Legislature, by the National Committee for Mental Hygiene, and was conducted under the direction of Dr. V. V. Anderson, director of the Division of Prevention of Delinquency.

The findings recorded in the report are based on the examination of a large number of children from typical schools in the state. Among recommendations made by the Advisory Committee are the following: State wide supervision of all children subnormal enough to need such care; increased institutional facilities for the care of the mentally defective; psychological examination of inmates of state institutions, defective delinquents and mentally abnormal types in courts; psychological examination of all children of three years' or more retardation; compulsory instruction by special class methods for all children in the public schools with a diagnosis of mental defect.

This report on state wide conditions, hitherto unrevealed and of unsuspected magnitude, bears witness to the crying need for the extension of scientific research and investigation in the form of mental surveys of localities in order that the full significance of one of our greatest social problems, the spread of mental deficiency, may be realized, its advance checked, and its evils finally prevented.

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News Items.

The American Electrotherapeutic Association.—The thirty-second annual meeting of the American Electrotherapeutic Association will be held on September 19th to 22d at the Hotel Pennsylvania, New York. Physiotherapy clinics and an exhibit of the latest type of apparatus will be included in the program. All legally licensed physicians are welcome. Address the registrar, Dr. Richard Kovacs, 223 East Sixty-eighth Street, New York.

Memorial to Dr. Lynah.—A scholarship at the Medical College of the State of South Carolina, Charleston, has been established by the American Bronchoscopic Society in memory of the late Dr. Henry Lowndes Lynah, a graduate of that institution in 1900. At the last meeting of the society a resolution was adopted that a scholarship of $100 be voted annually in memory of Dr. Lynah, who was one of the founders of the society, this sum to be applied to the scholarship to be established at the South Carolina Medical College, and that the dean of the medical school be empowered to award the scholarship to a deserving student.

Canadian Society of Anesthetists.—At the second annual meeting of the association held in Winnipeg in conjunction with the Canadian Medical Association, with Dr. Samuel Johnston as president in the chair, the following officers were elected for the next year: Dr. David H. Arnott, London, president; Dr. Walter L. Muir, Halifax, vice-president; Dr. F. Hoeffer McMechan, Avon Lake, Ohio, executive for the United States; and Dr. Wesley Bourne, Montreal, secretary-treasurer. Dr. Elmer I. McKesson, Toledo, Ohio, president of the National Anesthesia Research Society, spoke on Eleven Years' Observation of the Minute Volume of Respiration in Anesthesia.

Milbank Memorial Fund.—At Paul Smith's, Adirondack Mountains, on Monday, August 20th, the technical board of the Milbank Memorial Fund held a conference to discuss the best means of using Mrs. Elizabeth Milbank's bequest of $10,000,000 in a state wide war against tuberculosis. Among those who attended the conference were: Dr. Livingston Farrand, president of Cornell University, Dr. Hermann M. Biggs, Dr. Donald B. Armstrong, Dr. Otto R. Eichel, and Homer Folks. During her life Mrs. Milbank contributed much to aid the late Dr. Edward L. Trudeau in his campaign of education against tuberculosis.

Harvard Cancer Commission.—Dr. Robert Battey Greenough has been reappointed director of the Cancer Commission and surgeon in charge at the Collis P. Huntington Memorial Hospital. The other members of the Cancer Commission are Dr. Channing Chamberlain Simmons, secretary; Dr. James Homer Wright, pathologist in charge of the free diagnosis service; William Duane, research fellow in physics; Dr. Henry Lyman, research fellow in chemistry; William T. Bovie, research fellow in biophysics; Dr. Stuart Mudd, assistant research fellow in biophysics; Charles Elisha Barr, research fellow in biophysics, and Walter Scott Hughes, assistant in biophysics. The other officers of the Huntington Memorial Hospital are Dr. Channing Chamberlain Simmons, surgeon; Dr. George Gilbert Smith, surgeon; Dr. George Adams Leland, Jr., assistant surgeon; Dr. Henry Asbury Christian, consulting physician; Dr. George Richard Minot, physician; Dr. Thomas Ellwood Buckman, assistant physician; Dr. Ernest Merrill Daland, surgeon to outpatients; Dr. Leland Sterling McKittrick, surgeon to outpatients; Dr. Daniel Crosby Greene, laryngologist; Dr. L. B. Morrison, consulting röntgenologist; Dr. R. G. Giles, röntgenologist, and Dr. A. M. Greenwood, assistant dermatologist.

Personal.—Among the passengers arriving in New York on the steamship *Pan America* of the Munson Steamship Line on August 7th were Dr. Waldomiro de Oliveira and Dr. Jose Da Toledo Piza, who are coming to the United States as Fellows of the Rockefeller Foundation. They said that their studies would cover at least one year in this country.

Dr. Samuel Kahn, of 140 West Sixty-ninth Street, sailed on the *Majestic,* August 22d, for an extended trip abroad.

Dr. Stephen Rushmore, associate professor of gynecology, Tufts Medical School, has been elected dean, to succeed Dr. Charles F. Painter, who resigned a year ago.

Professor H. J. Hamburger, professor of physiology, histology, and physiological chemistry at the University of Grönigen, Holland, will deliver the Charles E. Dohme Memorial Lectures at Johns Hopkins Medical School, October 10th to 12th. The subject of his lecture will be The Increasing Significance of Permeability Problems for the Biological and Medical Sciences.

Dr. Arthur C. Morgan has been appointed professor of applied therapeutics in the Temple University Medical Department, Philadelphia, to succeed Dr. Charles E. deM. Sajous, who resigned recently on account of the age limit.

New Organization for the Study of Diseases of the Circulation.—In St. Louis, May 23d, a new organization was formed by a group of physicians interested in the study of diseases of the heart and circulatory system, for the purpose of providing a suitable forum for the discussion of matters concerning the study of diseases of the circulation. Dr. Stewart R. Roberts, of Atlanta, Ga., was elected president; Dr. S. Calvin Smith, of Philadelphia, vice-president; Dr. Cary Eggleston, of New York, secretary; and Dr. Walter W. Hamburger, of Chicago, treasurer. The chairman of the committee on organization is Dr. Joseph Sailer, of Philadelphia. The next meeting will be held in San Francisco, June 26, 1923. Further information may be obtained at the office of the association, 34 East Seventy-fifth Street, New York.

Faculty Changes at Johns Hopkins University.—To the faculty of hygiene and public health Dr. William W. Ford has been appointed professor of bacteriology, and Dr. Carroll G. Bull professor of immunology. To the faculty of medicine, Dr. Warfield T. Longcope has been made professor of medicine; Dr. Harold L. Amoss, associate professor of medicine; Dr. Robert S. Cunningham, associate professor of anatomy; Dr. Willam S. McCann, associate professor of medicine; Dr. Arthur L. Bloomfield, associate professor of medicine; Dr. Benjamin Kramer, associate professor of pediatrics; Dr. Esther L. Richards, associate professor of psychiatry; Dr. Albert Keidel, associate professor of clinical medicine; Dr. Wilburt C. Davidson, associate in pediatrics; Dr. Leslie B. Hohman, associate in psychiatry; Dr. Phyllis G. Richter, associate in psychiatry; Dr. Emil Novak, associate in clinical gynecology; Dr. Ernest H. Gaither, associate in clinical medicine; Dr. Wilder G. Penfield, associate in neurology, and Dr. J. Earle Moore, associate in clinical medicine.

Civil Service Examinations.—Among the positions for which the New York State Civil Service Commission will hold examinations on September 16th are the following:

Deputy Medical Examiner, Bureau of Deportation, State Hospital Commission; $3,500. Candidates must be physicians licensed to practise in New York State and must have had not less than five years of experience in the practice of medicine, including experience in the care and treatment of the committed or alleged insane in the New York State hospitals or elsewhere and experience with the problem of the alien insane and their deportation. A knowledge of the Insanity Law is expected.

Assistant Bacteriologist, State Department of Health; $2,101 to $2,500. Age limits twenty-five to forty-five years. Candidates must be graduated from an approved medical college and must have a thorough knowledge of the principles of bacteriology, pathology, infection and immunity.

Assistant in Pathology, State Institute for the Study of Malignant Disease, Buffalo; $2,500. Candidates must be graduated from a Class A medical school or a foreign university of recognized standing and have served a term as intern in a recognized hospital, or have completed postgraduate work in a pathological or bacteriological laboratory.

Assistant in Radiophysics, State Institute for the Study of Malignant Disease, Buffalo; $1,600. Candidates must be college graduates who have specialized in physics.

Obstetrician, Division of Maternity, Infancy and Child Hygiene, State Department of Health; $3,750 and expenses in the field. Minimum age twenty-five years. The duties include holding prenatal consultations, teaching maternity hygiene, lecturing, writing, and administrative work. Candidates must be graduates of a recognized medical college with special training or experience in obstetrics, including experience in lecturing.

Superintendent, County Tuberculosis Hospitals. Salaries vary in the different counties and part time employment is allowed in some counties. One immediate appointment expected at the Newton Memorial Hospital, Cassadaga, at from $3,000 to $5,000 with maintenance. Candidates must be licensed physicians who are graduates of a medical college of recognized standing with experience of at least three years in the practice of medicine.

Died.

Cameron.—In Philadelphia, on Wednesday, July 26th, Dr. J. Lawson Cameron.

Farrington.—In Philadelphia, on Tuesday, July 11th, Dr. Charlotte S. Farrington, aged forty-three years.

Gould.—In Atlantic City, N. J., on Tuesday, August 8th, Dr. George M. Gould, aged seventy-three years.

Groff.—In Philadelphia, on Saturday, July 1st, Dr. Charles A. Groff, aged sixty-six years.

MacCracken.—In Philadelphia, on Wednesday, July 26th, Dr. George Y. MacCracken, aged sixty-seven years.

Ritch.—In Brooklyn, N. Y., on Sunday, August 13th, Dr. Amos M. Ritch, aged sixty-one years.

Seaman.—In Locust Valley, N. Y., on Sunday, August 13th, Dr. Richard F. B. Seaman, aged sixty-eight years.

Siegelstein.—In Middletown, N. Y., on Wednesday, August 9th, Dr. Pierre A. Siegelstein, of New York, aged fifty-two years.

Smith.—In Montour Falls, N. Y., on Saturday, August 26th, Dr. Stephen Smith, of New York, aged ninety-nine years.

Varcoe.—In New York, on Monday, August 10th, Dr. William F. Varcoe, aged sixty-six years.

Youngling.—In Patchogue, Long Island, on Monday, July 25th, Dr. George Schultze Youngling, of New York, aged sixty years.

Zulich.—In Philadelphia, on Friday, June 23rd, Dr. Howell Shoener Zulich, aged forty years.

Book Reviews

PSYCHOANALYSIS.

Fundamental Conceptions of Psychoanalysis. By A. A. Brill, Ph. B., M. D., Lecturer on Psychoanalysis and Abnormal Psychology, New York University. New York: Harcourt, Brace & Co., 1921. Pp. vii-344.

Psychoanalysis. Its Theories and Practical Application. By A. A. Brill, Ph. B., M. D., Lecturer on Psychoanalysis and Abnormal Psychology, New York University; Formerly Adjunct Professor of Psychiatry, Post Graduate Medical School, New York. Third Edition, Thoroughly Revised. Philadelphia and London: W. B. Saunders Company, 1922. Pp. 468.

A good yet not complete concept of psychoanalysis may be gained from a reading of Brill's *Fundamental Conceptions of Psychoanalysis.* The material has been gathered from a series of lectures which he presented at the New York University. If the material had been better organized the book would serve as an admirable introduction to psychoanalysis. As it is, a great deal of ground is covered and a reading should serve as a stimulus to further investigation of psychoanalytical literature. Brill speaks clearly and with authority, for he is one of the pioneers in psychoanalysis, and it is much safer to follow his writings than so many which are dished up for popular consumption. He presents all of his material with sincerity, richly illustrating it with actual incidents and case records. A great deal of territory is covered. Some important analytical topics are not discussed as fully as they deserve, while others, perhaps not so important, are thoroughly presented. On the whole, it is a well worth while book and a distinct addition to the literature of psychopathology.

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The third edition of *Psychoanalysis* is well rounded out and an excellent presentation of the essentials of psychoanalysis. A fundamental concept of Freud's theories can be gained from a careful reading of this book. It contains a résumé of Freud's most important works and much material added from Brill's rich clinical experience. The practical is always considered. This makes for added value. Theories are always utilized for pragmatic purposes. Some of the material in this book has appeared in the New York Medical Journal. This third edition is a distinct improvement over former editions, which is as it should be in a subject so comparatively recent as psychoanalysis.

TECHNIC OF PSYCHOANALYSIS.

The Technic of Psychoanalysis. By David Forsyth, M. D., D. Sc. (Lond.), F. R. C. P. (Lond.), Physician (with Care of Out Patients), Charing Cross Hospital, New York: Moffat, Yard & Co., 1922. Pp. viii-133.

This book is called *The Technic of Psychoanalysis.* To attempt to give the impression that the technic, which should be learned by analysis with a psychoanalyst over a period of months, can be gained from a short monograph of this length, is erroneous. There are a few minor suggestions and a touching upon matters of vital import, but even here false impressions are given. To the tyro this book, unsupported by a large literature on analysis, is useless. The experienced in modern psychopathology will find no use for the book. It is as though a man had written a technic of surgery in two or three pages. It can not be done. The reading of books of this kind will not make an analyst. Self-analysis will not do it. There is no short cut. The impression given in this book is that there is little available literature in English on the subject. Most of the good material has been translated or abstracted either in the *International Psychoanalytic Press* in England, or by the *Psychoanalytic Review* and the *Monographs of the Journal of Mental and Nervous Disease Publishing Company* in this country; in addition there is a voluminous literature containing the works of Freud, Jung, Adler, Stekel, Jones, Pfister, Brill, Kempf, Jelliffe, and White, and many others published by various reputable publishing houses in England and America.

PSYCHOANALYSIS AND THE DRAMA.

Psychoanalysis and the Drama. By Smith Ely Jelliffe, M. D., and Louise Brink, A. B. *Nervous and Mental Disease Monograph Series* No. 34. Nervous and Mental Disease Publishing Company, Washington and New York, 1922. 3617 Tenth Street, Washington, D. C.

This monograph contains a series of psychoanalytical essays which have been constructed about the drama. Various plays which have appeared in New York have been taken up in turn and much valuable material of an instructive character has been gathered and presented. Each essay may be considered separately and yet the monograph has continuity of thought and purpose which serve to bind it into an integrated and most readable whole. Many of the analyses in this monograph have appeared in the New York Medical Journal, some in the *Medical Record,* and some in other publications. Their value has been greatly enhanced by their presentation in the monograph form.

PSYCHOANALYSIS AND THE FAMILY.

The Psychoanalytical Study of the Family. By J. C. Flugel, A. B., Senior Lecturer in the Department of Philosophy and Psychology, University College, London; Sometime John Locke Scholar in Mental Philosophy in the University of Oxford; Honorary Secretary of the International Psychoanalytical Association. *The International Psychoanalytical Library,* No. 3. London, Vienna, and New York: The International Psychoanalytical Press, 1921. Pp. x-259.

A most scholarly presentation of the psychology of the family as revealed by modern methods of exploration. The book carries us into many channels and covers much ground. With the reading a fair general concept of psychoanalysis from a most authoritative source will be gained. Society is built up around the family and in order to understand all of the conditionings encountered in familial situations all of the social and individual psychological structures must be carefully considered. This Flugel has done. The writing is lucid and it is a relief to read a work of this character after wading through so much of present day literature that is dogmatic and inaccurate.

The book should be widely read, not alone by physicians, but by anyone who wishes to know more of themselves and those about them and the why of many things until recently unanswered.

HOMOSEXUAL NEUROSES.

Bisexual Love. The Homosexual Neurosis. By Dr. William Stekel, Vienna. Authorized Translation by James S. Van Teslaar, M. D. (For Sale Only to Members of the Medical Profession.) Boston: Richard G. Badger, 1922. Pp. viii-359.

There have been many of Stekel's books translated into English recently. This one is the most valuable of the lot. In it there are many stimulating and really worth while observations. This can not be said of some of his works where he tries to popularize or more exactly dramatize psychoanalytic material in the name of poetry.

PSYCHOLOGY OF MEDICINE.

The Psychology of Medicine. By T. W. Mitchell, M. D. New York: Robert M. McBride & Co., 1922.

This is a well written book which handles an intricate problem in an exceedingly illuminating fashion. Mitchell traces the development of psychology in medicine up to the latest findings of present day psychopathology. He has clarified many obscure points and presented them more clearly than most writers have done in the past. There are some historical errors of minor import which do not detract from the work as a whole. No doubt in later editions, which it is hoped will soon follow, these will be corrected. The chapters on the unconscious, the neuroses, therapy and preventive measures are all of prime importance and should be read by everyone engaged in medical practice.

COUÉ'S METHOD OF AUTOSUGGESTION.

The Practice of Autosuggestion by the Method of Emile Coué. By C. Harry Brooks. With a Foreword by Emile Coué. New York: Dodd, Mead & Co., 1922. Pp. 119.

Those wishing to know more of the subject of autosuggestion will not find much that is new in this book. From a scientific point of view the entire subject has little value, as it closes the doors to investigation of functional diseases. It is interesting to note that the very persons who practise suggestion as a therapeutic agent know nothing of the real mechanism of its functionings. Newer and more fundamental psychotherapeutic measures have long since superseded those of autosuggestion.

CYSTOSCOPIC ATLAS.

Kystoskopischer Atlas. Ein Grundriss für Studierende und Arste. Von Dr. med. Erich Wossidlo, Urologe, Berlin. Zweite Auflage. Mit 41 Abbildungen im Text und 42 farbigen Tafeln mit Tafelerklarungen. Leipzig: Verlag von Wilhelm Engelmann, 1921. Pp. viii-98.

Wossidlo has produced another of the popular cystoscopic atlases which have come out of Germany from time to time. There are about a hundred pages of text matter, in which the usual history, technic and therapeutic indications of cystoscopy are discussed by the author, who undoubtedly is recognized as one of Germany's best known urologists. The plates are unusually clear and explicit, and the explanatory notes aid materially in describing them. Any one who has done much cystoscopy will at once recognize how true to life these illustrations are. The coloring is not overdone, and the various pathological lesions stand out distinctly and clearly, as one would expect to see them in the living patient through the cystoscope. It is a pity that American publishers have not yet been able to produce such beautiful work as this, but it is to be hoped that the future may correct the present technical shortcomings in this respect. The reviewer can safely recommend this work as a valuable addition to the working library of the surgeon who desires to know what it is that he sees through the cystoscope.

GYNECOLOGY AND OBSTETRICS.

Diagnostische und therapeutische Irrtümer und deren Verhütung. Frauenheilkunde. Herausgegeben von Prof. Dr. J. Schwalbe, Geh. San.-Rat in Berlin. Abt. Gynäkologie, Erstes Heft: Krankheiten der äussern Geschlechtsteile und der Vagina, der weiblichen Blase, des Harnleiters und der Harnröhre Gonorrhoe, Syphilis ind Tuberkulose der weiblichen Geschlechtsorgane, von Prof. Dr. Henkel, Direktor der Universitäts-Frauenklinik, Jena, mit 9 Abbildungen. Zweites Heft: Krankheiten des Uterus, von Prof. Dr. Karl Riefferscheid, Direktor der Universitäts-Frauenklinik Göttengen, mit 5 schwarzen und 5 farbigen Abbildungen. Drittes Heft: Krankheiten der Ovarien, Tuben, Ligamente des Uterus und Beckenbindegewebe, Bauchfell, von Prof. Dr. Rud. Th. von Jaschke, Direktor der Universitäts-Frauenklinik, Giessen, mit 12 Abbildungen. Abt. Geburtshilfe, Erstes Heft: Geburt, von Geh. Med.-Rat Prof. Dr. Fehling (vormals Direktor der Universitäts-Frauenklinik in Strassburg), in Baden-Baden, mit 2 schwarzen und 3 farbigen Abbildunger. Zweites Heft: Wochenbett, von Prof. Dr. Zangemeister, Direktor der Universitäts-Frauenklinik, Marburg a. L., mit 2 Abbildungen.

These two sections on gynecology and obstetrics form part of a system of general medicine, which is intended to serve the purpose of refreshing the mind of the physician after his return to civil practice from war experiences. The various sections are printed as monographs which are written by several authorities in their respective subjects. Not only the general practitioner but even the specialist will find much food for thought in these monographs and with their aid he will be able to avoid many a diagnostic and therapeutic error of omission or commission.

Henkel describes the diseases of the external genitals and of the vagina, the female bladder, ureter and urethra, and also treats of the subjects of gonorrhea, syphilis and tuberculosis of the female sexual organs. The handling of the subject of the uropoietic system is very thorough and exceeds anything heretofore published in the usual textbooks on gynecology. This branch of the subject is peculiarly adapted to more diagnostic erors than any other, as for example the subject of "blood in the urine" which requires exhaustive studies to determine the source of the blood. All of the latest methods of urological study are discussed. The subject of urinary fistulæ is treated exhaustively. The diseases, inflammations and displacements of the uterus and menstrual anomalies are discussed by Reifferscheid. The minor operative procedures are also taken up, together with their indications; the technical difficulties involved and the severe results from their misapplication are well shown. Von Jaschke gives a short résumé of the three symptoms: 1, menstrual disturbances; 2, secretory disturbances, and 3, pains. The diseases of the ovaries, tubes, pelvic connective tissues and of the peritoneum, especially the pelvic peritoneum, are taken up in detail. The causes and dangers of mistakes are effectively pointed out and the correct methods and means are carefully described.

The second section deals with obstetrics. The monograph on labor by Fehling is particularly well written and rightly so, for in no other branch of medicine do mistakes occur so frequently and with such disastrous results. The part dealing with the puerperium and written by Zangemeister takes up first those phenomena of the normal puerperium which might be mistaken by the tyro as signs of disease. The incorrect precautions and measures so often encountered in normal pregnancies are discussed and finally, the diagnostic and therapeutic errors in the individual diseases of the puerperium are taken up.

The final monograph on pregnancy, to be written by Fehling, is announced by the publisher.

THERAPEUTICS.

A Textbook of Practical Therapeutics with Especial Reference to Disease and Their Employment Upon a Radional Basis. By HOBART AMORY HARE, M. D., LL. D., B. Sc. Eighteenth Edition, Enlarged, Thoroughly Revised and Largely Rewritten. Illustrated with One Hundred and Forty-four Engravings and Six Plates. Philadelphia and New York: Lea & Febiger, 1922. Pp. xiv-1038.

This is the eighteenth edition of Hare's reliable textbook. In common with most textbooks of this class pathological physical conditions and drugs are stressed. Etiology and preventive measures receive scant attention. It may be argued that these are beyond the province of works of this kind. However, it is always well to combine these points if we are to fulfill our duty. The why of things should always be investigated if we are to "cure" to the best of our ability.

PSYCHOPATHOLOGY IN FICTION.

The Secret Places of the Heart. By H. G. WELLS. New York: The Macmillan Company, 1922. Pp. 287.

Aaron's Rod. By D. H. LAWRENCE. New York: Thomas Seltzer, 1922. Pp. 347.

This is not what one would call a moral or even an honest book. Wells has produced some highly interesting and very good material, but this does not give him the right to misrepresent an important therapeutic procedure even in novel form. Psychoanalysis has been made capital of by various charlatans in various guises. If Wells is too busy writing world histories, children's books, and settling affairs of state to make a thorough study of his subject of various sundry countries he had best leave the portrayal of psychoanalytical technic to those who know. His analyst tags after a coal baron's heels over the week end in order to minister to him and give him peace of mind. If Wells knew the first elements of analysis he would not make this *faux pas.* Then the analyst discusses a few superficialities and this is called analysis. No dreams, no effort to explore the unconscious, just the exchange of a few pseudophilosophical halfbaked ideas in Wellsian fashion and presto! the analysis is under way. How unfortunate it is not as simple as Wells in his simplicity would have us believe. There is no objection to his doing this in fiction or anywhere he may choose, but where does he get the temerity to call it psychoanalysis? Why does he not call this process by some more appropriate title—agriculture, balistics, calisthenics, biometry or anything more nearly related to it than psychoanalysis?

Now for the immorality of his tale. This really should cause Mr. Sumner to read the book carefully. Even the sex saturated socalled psychoanalyst averts his gaze and leaves the scene. The coal baron, who is the hero of Wells's legend, in his archeological wanderings through Merrie England with his analytical appendage encounters two Americans, shall we say ladies? He is bored and prepared to be unbored. The doctor warns him and tells him if he persists he shall leave him to his own sin and destruction. But the baron can not resist. The analyst à la Wells reminds the opulent baron of his mistress, who is the mother of an illegitimate child and suffering from carbuncles at the moment of the controversy. This is very modern even for an analyst. There is no thought of the wife. There is only the reminder of the carbuncled mistress and the debt he owes her.

So the baron rushes on to an affair (with the more charming of the two young ladies). Then they must part, for she has a male parent, an ogre, and very rich. Parting over, the baron dies after some very hard work on some committee or other and the kind hearted analyst soothes the various female mourners of this most heart rending farce. Even if Wells were more accurate one would wonder and wonder what it was all about.

* * *

Lawrence has written several books which have been put out as works of fiction. During this period we had an interlude when Lawrence wrote a choice piece of belly music called *Psychoanalysis and the Unconscious.* To the psychopathologist the behavior of Lawrence's heroes in *Women in Love* and *Aaron's Rod* and his other work should prove of interest. We find them unable to face heterosexual situations, although they find nothing in the situations *per se* which is objectionable. They flee from these situations, squirm about trying to find comfort in a type of narcistic independence, while they are continually upset by a suppressed homosexuality. The usual and many unusual rationalizations are advanced to justify their attempt at emancipation from the bondage of women, in other words, to emancipate themselves from heterosexuality.

The analerotic trend of the situation is little disguised. There is a constant play on posteriors, buttocks, anal regions, bellies, and the oral region.

A symphony of the gastrointestinal tract is woven into the fabric of both *Women in Love* and *Aaron's Rod.* The behavior of the characters may seem morbid enough to the casual reader, yet we find similar situations repeated with great frequency in various marital episodes. From the point of view of fiction the books may hardly be called savory or even remotely constructive, but as case material they may be readily utilized by the student of human behavior.

Medicoliterary Notes.

An attempt to distribute, on a national scale, to expectant mothers the proper and necessary information about care of themselves and child is being made by the Maternity Centre Association, with headquarters at 370 Seventh Avenue. The centre has just prepared for the benefit of women in all parts of the country a series of twelve *Talks to Mothers.* These are small pamphlets, very simply and popularly written, and may be had upon application to the Maternity Centre for twenty-five cents a set. They give helpful and practical suggestions and directions for the care of mother and child from the earliest indications of maternity to after care of the mother and the giving of the child a proper start in life.

* * *

Wickliffe Rose, Ph.D., general director of the International Health Board, has an article in the *American Review of Reviews* for July on Epidemic Control in Europe and the League. He describes the new health section of the League of Nations and advocates cooperative work on the part of this section by the United States, officially through the Public Health Service and privately through the International Health Board.

* * *

The National Health Council and the health organizations represented thereby have planned three National Health Days as a stimulus to the improvement of individual and community health. These days will be Friday, Saturday, and Sunday of the second week in December. State and local health officers will organize their respective territories and there will be addresses, parades, and ceremonies to interest and stimulate both adults and children.

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Arthur Symonds has in the *Forum* for July a note on the Genius of Auguste Rodin which is an interesting character study of the great French sculptor.

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The State Charities Aid Association has made the *S. C. A. A. News* for June a fiftieth aniversary number. A survey of the work done by the association during the fifty years of its existence, and a description of the various fields of its present endeavor, are the chief features of the issue.

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The serum treatment for snake bite and the so-called snake farms operated for preparing this serum are described by Harry L. Burnham in an interesting article in the *Illustrated World* for July.

* * *

During the summer the American Relief Association, with the cooperation of the Young Men's Christian Association, has been able to supply food to 6,700 needy students in Russian universities. This group represents the future doctor, nurse, engineer, agriculturist, forester and scientist of Russia. By means of this feeding program students were enabled to devote their meagre resources to acquiring the other necessities of life and, to an extent, to the purchase of books and other supplies needed for their studies, articles which are at present so expensive as to be practically prohibitive. A pencil costs 80,000 roubles.

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The Thunder of Our Hearts is the title of an article in *Popular Radio* by J. C. Gorman. The enormous amplification of sound effected by putting together a series of triodes or audions is described, with special application to listening to physiological sounds.

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Dr. J. H. Mason Knox, Jr., field director of the American Red Cross, has in a recent number of *Mother and Child* an interesting account of the indications evident in France of the general determination to resuscitate from losses in population caused by the war, and by the prewar declining birth rate. In 1913 there were in Paris 48,609 births and 44,385 deaths; in 1920 there were 55,770 births and 43,057 deaths.

* * *

In a recent issue of the *Journal of Philosophy* Knight Dunlap, Ph.D., of Philadelphia, in an article on Instinct, states the following conclusion: "I can see no way of distinguishing usefully between instinct and habit. All reactions are definite responses to definite stimulus patterns, and the exact character of the response is determined in every case by the inherited constitution of the organism, *and* the stimulus pattern. If we consider instinct, we find it to be the form and method of habit formation; if we consider habit, we find it to be the way in which instinct exhibits itself." William McDougal replies to this puerile attitude in an article in the *Journal of Abnormal Psychology and Social Psychology* (December, 1921, and March, 1922). This article of McDougal's is the basis of an editorial in the present issue of this journal.

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The New England Health Institute, suggested by the United States Public Health Service, and held in Hartford, was enthusiastically received and attended, with the result that it has been recommended that the Institute be an annual occurrence, the next meeting place to be Boston or vicinity.

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New Publications Received.

MORE BEETLES. By J. HENRI FABRE. New York: Dodd, Mead & Co., 1922. Pp. 315.

THE CARE OF INFANTS AND YOUNG CHILDREN. By A. DINGWALL FORDYCE, M. D. Edinburgh: E. & S. Livingstone, 1911. Pp. 158.

LEHRBUCH DER GRENZGEBEITE DER MEDIZIN UND ZAHNHEILKUNDE. Von Dr. JULIUS MISCH. Leipzig: Verlag von F. C. W. Vogel, 1922.

PRÉCIS DE KINÉSITHÉRAPIE. La Mobilisation Méthodique la Massotherapie. La Méchanothérapie, La Réduction, La L'Éducation Physique. Par P. Kouindjy. Paris: A. Maloine et Fils, 1922. Pp. vii-324.

THE THYROID GLAND. Clinics of George W. Crile and Associates. Edited by AMY F. ROWLAND. With One Hundred and Six Illustrations. Philadelphia and London: W. B. Saunders Company, 1922. Pp. 288.

CRONICA MEDICO-QUIRURGICA DE LA HABANA. Dirigida por el Dr. JUAN SANTOS FERNANDEZ; Redactor Jefe Dr. FRANCISCO M. FERNANDEZ; Secretario Dr. J. E. LOPEZ SILVERO. Habana: Cronica Medico-Quirurgica, 1922. Pp. 343.

Practical Therapeutics

OCCUPATIONAL THERAPY IN MENTAL HOSPITALS.

By J. Allen Jackson, M. D.,
Danville, Pa.,
Superintendent State Hospital for Insane.

Some time ago (1) I outlined an organization, from an administrative viewpoint, of occupational therapy in mental hospitals and desire now to present the application of occupational activities in accordance with such an outline of organization.

The term occupational in the previous article and in the present writing is used in the sense of relating to any busy state which benefits the patient's mental condition, grouping under the heading of occupational activities all types of occupation, diversion and recreation. I cannot accept the view that restricts the meaning of occupational activities to the employment of a small industrial unit, where possibly a room is set aside and a group of perhaps twenty to twenty-five patients daily are receiving training or instruction. Occupational agencies with all their fields of usefulness cannot be limited to such a small sphere.

To apply a measure thoroughly and efficiently we should make as far as possible individual selection of patients and the form of therapy used. In dealing with certain types of mental cases, such as refractory and demented types, this is impossible and we must approach the group as a whole. We assume, therefore, that every state hospital has six distinct classes, namely: The acute treatment group; the sick and infirm group; the refractory group; the mildly chronic group; the convalescent group, and the epileptic group. Occupational agencies should be carried to each group.

ACUTE TREATMENT GROUP

I am not unmindful of the great varieties of cases included in this group and that many administrators advocate assigning certain types of these cases directly to the socalled arts and crafts room. It would seem, however, that if we adhere to the principle of the S. Weir Mitchell treatment, which consists of rest in bed, full feeding, mild physical therapy, massage and light diversion and invalid occupation, we fulfill the requirements of treatment and the diversion of arts and crafts in work rooms should be held in reserve until the patient is sufficiently aroused that his attention can be directed. At this time he should be assigned to the arts and crafts room, where he may then participate in other forms of occupation.

The keynote of treatment, therefore, seems to be rest in bed, full feeding, hydrotherapy, physiotherapy, and light diversion with some form of occupation for invalids. This diversion should consist of activities not extending over an hour a day and modified to meet the individual requirement. The activities should consist of diversion at the bedside, outdoor walks, victrola concerts, games, cards, class readings, individual reading, alternating daily. Certain types of cases may attend chapel services, prayer services and entertainments. We should reach at least thirty-five per cent. to forty per cent. of these cases with therapeutic employment and diversion.

SICK AND INFIRM GROUPS

The sick and infirm group, as the name implies, signifies a class of bedridden and feeble patients. About forty to fifty per cent. of these cases may appreciate the following activities: light employment in its many forms, outdoor walks, victrola concerts, light mending, and some form of occupation for invalids, assigned in such a way that it is used on alternating days; church services and other entertainments. Such a program, it would seem, meets the needs of this group of patients.

MILDLY CHRONIC GROUP

This group of patients is the one on which the hospital depends for definite economic returns, which at the same time mean health and individual comforts to the patients. In the female department, this group makes up the percentage of workers in the culinary service, domestic service, sewing rooms, laundry, the runners, art and craft workers, and others.

In the male department this group is relied upon for manual labor in the various divisions of the hospital, such as dining rooms, store rooms, power houses, laundries, farms, dairies, piggeries, industrial buildings, and other places. For their diversion, both in the male and female departments, proper reading rooms, pianos, musical instruments, chapel services, outdoor sports, dances, and entertainments should be provided. We should reach one hundred per cent. of this group.

REFRACTORY AND DEMENTED GROUP.

It is difficult to approach this group of patients with a satisfactory form of occupation or diversion. Many of these patients, although they require close supervision, thrive under employment which requires considerable physical effort. Another group, especially in the female department, may be reached by a special teacher providing sewing, mending, embroidery work, arts and crafts, etc. Still another group may enjoy diversion such as walks, outdoor exercise, victrola concerts, chapel service, entertainments, and special classes. It is particularly gratifying to note that a great percentage of this group of patients at the Danville State Hospital participate in the latter forms of diversion. Practically ninety per cent. of these patients are reached daily with either useful employment or daily walks in the airing courts both summer and winter.

CONVALESCENT GROUP

This group, as the name implies, may enjoy any or all of the forms of occupational therapy offered by hospitals, all indoor employment such as arts and crafts, and various industries, or all outdoor work. This particular group of patients enjoys all forms of diversion and recreation provided by each hospital. In the analysis hereto appended this group is included with the mildly chronic.

EPILEPTIC GROUP

The epileptic patients, if in selected groups with specially trained nurses, may be usefully occupied and pleasantly diverted, with the many forms of occupational therapy offered, such as sewing, embroidering, basketry, cement work, gardening, horticulture, nurseries, and other occupations.

To insure the best application of occupational therapy, it is necessary to outline a definite program for each of the classes represented. Such a program under the supervision of the assistant medical superintendent, outlined to the nurses through the directress of nurses, will accomplish the desired results, bearing in mind that there is no discrimination against trained occupational teachers, who, in addition to instructing the nurses, may supervise the work in the industrial buildings, arts and crafts rooms, as well as plan specific therapy to meet the physicians' prescriptions for specific groups or individual cases.

In order that the hospital administrator may check daily the occupational activities of the hospital, the following form, which may be modified to meet the needs of the particular institution, will be found useful:

DAILY REPORT OF OCCUPATIONAL ACTIVITIES.

Female.................. *Date*...................

Census in house .... ——
Number engaged in occupational activities.......... ——
Number unoccupied .... ——
Number engaged in useful activities............... ——
Number engaged in occupational activities otherwise. ——

ANALYSIS OF OCCUPATIONAL ACTIVITIES.

Usefully employed:
Ironing room ....; Kitchen .... ——
Sewing room ..; domestic work out of wards .. ——
Ward work .....; sewing .....; knitting ..... ——
Mending ....; industrial room .... ——
Total.............. ——

Otherwise:
Riding ....; walking; .....; conservatory..... ——
Airing courts ....; outdoor games .... ——
Fancy work ......; reading and writing ...... ——
Indoor games ..; occupational therapy classes .. ——
Total.............. ——

Physical therapy:
Acute building ....; main building .... ——
Local parole .... ——
Entertainment:
Chapel ....; amusement hall .... ——
Picnics ....; otherwise .... ——

Directress of Nurses.
Approved: ——————————
Assistant Medical Superintendent.

To summarize briefly the program we have, we find available for all groups definite recreational and diversional periods, as well as some form of employment. The recreational and diversional periods consist of outdoor walks, games, music, entertainments, chapel services, outdoor gymnastics, dances, sleigh rides, picnics at the cottage, and cross country walks.

The various types of occupation provided for those in the female department, who are unable to attend the working rooms or indulge in useful employment are knitting, sewing, embroidering, mending, and needle work. Basketry and raffia work are to be added. In the male department the problems vary somewhat for this group of cases. We find, however, that physical therapy is very valuable for arousing general interest. Basketry and weaving are to be added to the program.

The types of occupation provided in the working rooms of the female department consist of basketry, raffia, crocheting, tatting, designing, embroidering, dress making, knitting, sewing, and housekeeping. In the male department the types of occupation provided for these groups are agriculture, construction and repair work, broom making, harness making, shoe repairing, gardening, cement work, tinsmithing, painting, mattress making, repairs to furniture and equipment, cabinet work, printing and loom weaving.

While such a comprehensive program is helpful in covering large groups of patients, we should not overlook the needs of the individual. Dr. W. L. Russell of the Bloomingdale Hospital well expresses this phase of the subject in a personal communication to the writer, when he says, "The occupational approach should be made as soon as the patient becomes accessible. Sometimes the first favorable response is obtained by means of recreational activities such as games, physical exercise, social dancing, etc. At other times, the patient responds first to more serious activities, such as basketry."

A statistical analysis of the application of occupational activities as outlined at this hospital shows the following:

MALE DEPARTMENT

Acute group.—In the male acute treatment wards there are housed forty-seven patients, fifteen of these are usefully employed, five enjoy reading and indoor games, while twenty-seven are receiving bed treatment. Those usefully employed each week attend the entertainments, while reading material and victrola concerts at stated intervals are available.

Epileptic group.—in the male epileptic wards there are seventy-two patients, thirty-five of whom are usefully employed while eighteen are reached by walks and concerts, and nineteen are physically incapacitated. This group also enjoys the chapel services and entertainments.

Convalescent or mildly chronic group.—In these wards are housed 210 patients, who are usefully employed during the day and in the evening are diverted by chapel services, pictures, reading, pool, victrola, cards, indoor games, and other recreations.

Infirmary group.—In the infirmary wards are housed 222 patients, of these eighty are usefully employed, sixty-five confined to bed, while thirty-four are diverted by reading, walking, and games, and forty-three are chair cases too decrepit to reach with diversion.

Refractory and demented group.—In this group are 282 cases. Of these 171 are usefully employed, while 111 are diverted by walks in the morning and afternoon. To those usefully employed in this group evening services and moving pictures are available as in the convalescent or mildly chronic type, and victrola concerts and indoor games provide them with further diversion.

FEMALE DEPARTMENT

Acute group.—In this group of fifty-six cases, thirty are usefully employed, sixteen are reached with reading, walking, fancy work and concerts, while ten are acutely disturbed.

Epileptic group.—There are seventy-seven patients in this group; forty-seven are usefully employed, while thirty are diverted by victrola concerts, reading, and other occupations.

Convalescent or mildly chronic group.—There are 243 in this group, 214 of whom are usefully employed, while twenty-nine are otherwise diverted. These patients enjoy chapel services, entertainments, cards, reading, piano concerts, and similar diversions.

Infirmary group.—In the female infirmary group are housed 148 patients. Of these fifty-four are usefully employed, forty-two are diverted by reading, walking, and games, while fifty-two are bed and chair invalids.

Refractory and demented group.—In this group there are 280 patients, 129 of whom are usefully employed, 120 diverted by walks, reading, concerts, and special occupational teachers, while thirty-one are mentally and physically disabled.

A general summary reveals that eighty per cent. of the male patients and seventy-nine per cent. of the female patients are reached by such an organization of occupational therapy.

Garlic as a Hypotensor Remedy and Heart Stimulant.—Loeper, Debray, and Pouillard (*Presse médicale,* June 3, 1922) report animal experiments on the effects of garlic on the circulation and state that in man twenty to thirty drop doses of a tincture made by maceration in equal parts of fresh garlic in alcohol, given by mouth or hypodermically, produce a fall of blood pressure which begins within an hour, increases in the succeeding twenty-four hours, and amounts to from twenty to forty millimetres of mercury. The giving of an excessive dose, such as fifty or sixty drops, no longer lowers the blood pressure, while eighty drops may slightly raise the blood pressure. The effect is kept up by a second injection on the succeeding day, at times by a third injection, but seldom by a fourth injection. Not more than ninety to one hundred drops should be given in four days; then, after five days' rest, the drug can be given again with its initial effect. Upon giving four drops of the tincture in cardiac and aortic cases for ten successive days the authors noted a marked improvement of the heart rhythm and amplitude, a rise of the diastolic pressure, and increased vigor of the radial pulsations; even diuresis and disappearance of edema were observed. These effects were sometimes noted even after failure of digitalis treatment owing to excessive use. Large doses should not be given in these cases, otherwise a peculiar type of arrhythmia characterized by one strong beat followed by three weak beats, is likely to appear.

Therapy of Cardiospasm and Cardiostenosis (Esophagogastroanastomosis).—H. Finsterer (*Wiener klinische Wochenschrift,* May 25, 1922) reports two cases of cardiostenosis which were cured by operation. From the anatomical viewpoint, both cases showed stenosis as a result of cicatricial bands, which stretched from the left lobe of the liver over the cardia to the upper pole of the spleen and also an enormous hypertrophic ring musculature of the cardia. The adhesions resulted from a former ulcer at the cardia which gradually healed and the hypertrophic musculature was analogous to the hypertrophy of the musculature seen in pyloric stenosis. A more or less lasting stenosis at the cardia may be associated, leading to the enormous hypertrophy of the musculature and increased peristalsis of the esophagus. In these cases bougies are valueless and a broad anastomosis between the esophagus and the stomach is the best treatment. This operation is not dangerous because the nutrient vessels are spared and there is no tension on the sutures; besides, in these cases, the esophageal wall was markedly hypertrophic, thus insuring successful suture. To secure asepsis, the esophagus should be irrigated before the operation, if necessary with the aid of the esophagoscope, and the mucosa may be painted with iodine. Pleural injury should be avoided so as to prevent the occurrence of an empyema. The suture may be made secure by doing the gastrostomy at the end of the operation and by leaving the drainage tube in situ for three to four days, so as to prevent the accumulation of gastric juice and the occurrence of vomiting. After the fourth day the patient is nourished through the gastrostomy. The technic is not unusually difficult. Both cases were done under splanchnic anesthesia, one with the Kappis technic and the other anteriorly with fifty c. c. of a 0.25 per cent. solution of novocain. The late and permanent results are excellent. Only cases of true spasm of the cardia should be selected and not those of socalled hypertonic condition of the ring musculature.

The technic consists of a laparotomy incision along the left costal border, and division of the adhesions and of the peritoneum from the diaphragm and of the left vagus. The esophagus is then retracted with a sling and an anastomosis six cm. wide between the esophagus and the fundus is made. A three layered interrupted suture is applied, with special care to the coaptation of the wound. The gastric fundus is then fixed to the diaphragm to prevent prolapse of the esophagus. Finally, a gastrostomy is done in the pyloric region and the drain is led out through a special incision. The abdominal wound is then sutured in three layers.

Sodium Nucleinate in the Treatment of Malaria in Paretics.—Heinrich Kogerer (*Wiener klinische Wochenschrift,* April 13, 1922) reports his results in twenty-five cases. He activated his cases by injecting five c. c. of a ten per cent. sterile solution of sodium nucleinate intramuscularly and he then examined the blood daily in thick drop preparations. The positive blood findings and attacks in the tertiary cases occurred most frequently on the first day following the injection; there also were some attacks on the third, fifth, and eighth days respectively. The cases may be grouped into two classes. The first group comprised twenty-two cases, in which the injections were given at the end of countertreatment with quinine and neosalvarsan in order to determine the absolute cure of the inoculated malaria. After a few hours a transient febrile reaction followed. The second group included three cases in which the malarial attacks ceased spontaneously and the injections of sodium nucleinate served the purpose of provoking further attacks. This procedure shows that inoculated malaria can be influenced therapeutically more easily and certainly than the form produced by the anopheles mosquito.

Proceedings of Societies

NEW YORK NEUROLOGICAL SOCIETY.

Three Hundred and Ninety-sixth Regular Meeting, Held on April 4, 1922, at the New York Academy of Medicine.

The President, Dr. Foster Kennedy, in the Chair.

Pathological Findings in the Heart in Progressive Muscular Dystrophy.—Dr. Joseph H. Globus, of New York, said that some years ago he had had an opportunity to observe the pathology of the heart in a small number of cases of progressive muscular dystrophy. His attention had been drawn to one feature, particularly in two cases, viz., that after a long period of *status quo* there suddenly developed a sequence of events which ended fatally. The patients were fairly well, when without warning, there suddenly appeared pulmonary edema, hydrothorax, hydropericardium, with death in twenty-four hours after onset of symptoms. The opinion expressed for several years had been that death in these cases of progressive muscular dystrophy was due to paralysis of the diaphragm, but he believed that in some cases there was another cause operative, namely, cardiovascular disturbance. On studying the heart carefully anatomically, he had found definite changes in the heart muscle, not differing in any way from those in the skeletal muscle. One case was not sufficient upon which to base definite conclusions, and another case was waited for and careful examination made. Lesions were again found which corresponded to changes in the skeletal muscle. Dr. Goodhart had reported this case with him, but the cardial lesion had not been sufficiently stressed. Later another case was examined and well defined changes were found.

In the literature two types of observations were recorded. Oppenheim in 1911 recorded these lesions as a disease of the central nervous system, but other workers had interpreted them as myopathic in character. Oppenheim did not feel that the heart was affected similarly to the skeletal muscle, while other workers took the opposite view. Thus two viewpoints were reported: those that recorded clinical observations without anatomical findings and vice versa. Among the clinical reports were those of enlargement of the heart, irregularity, increase of rate and intensity of the heart beat, and palpitation on exertion. On going through the literature he had found only eleven cases reported since 1879 in which the hearts were studied. Eight of these recorded definite myocardial lesions, in no way differing from changes found in the skeletal muscle. The other three cases were not so definitely grouped. There were changes, however, in color, consistency and invasion of subepicardial fat.

Dr. Globus reported the clinical history of a boy, ten years of age, with progressive muscular dystrophy, who died twenty-four hours after the extraction of a tooth. On autopsy, the muscles were found infiltrated with fat, including the diaphragm. No excess of fluid was found in the thorax. Several small pneumonic areas were found in the lower lobes of the lungs which were edematous. The heart was flabby and on section the wall of the left ventricle showed many translucent patches, irregularly distributed, apparently areas of fibrosis which bore no relation to the bloodvessels. The thymus was large, solid, and rich in lymphoid tissue. The liver showed marked fatty infiltration.

Microscopically, the heart showed many connective tissue scars. Individual heart muscle fibres were seen in various forms of degeneration surrounded by massive bundles of connective tissue. Fat was found in the connective tissue and about the bloodvessels. Many small round cells were seen, interpreted as a reactive phenomenon to the degenerative changes nearby. The muscle fibre changes were edema with swelling or atrophy, hyalinization and fragmentation. In the thymus were a large number of vessels, some almost completely occluded by proliferation of endothelium. Lantern slides were used to demonstrate the various pathological conditions found microscopically in the heart, thymus and skeletal muscles.

The conclusions reached by Dr. Globus were that the heart did not escape myopathic processes in progressive muscular dystrophy. The changes were milder in degree than those in the skeletal musculature. The changes would be more frequently found if the heart were studied more systematically during life, as well as anatomically after death. The heart played an important rôle in causing death in progressive muscular dystrophy.

Dr. Walter Timme said he thought that what Dr. Globus had said emphasized the protean character of the disease and its involvement of practically every organ, but not necessarily in every case. Cases will be found in which there was marked myocarditis demonstrable in life, and many cases in which it was not demonstrable until after death. He said he had seen a case in a man eighty-two years old, who had had the disease since infancy. He was a preacher and had to be carried to the pulpit. He had no sign of myocardial disease. The dystrophy manifested itself in fourteen descendants in three generations, but in none of them was there myocardial disturbance. It was a slowly progressive disease in the milder forms, and in these there was no myocardial disturbance. Another form of the disease, as described by Gowers, in which death occurred early, from the sixteenth to the nineteenth year, there was usually a cardiac condition and one in which fatty degeneration assumed marked proportions. He thought the disease should not be considered exclusively as a muscular one. It was not a pure myopathy but the myopathies which occurred were the most outstanding feature. Other atrophies, other dystrophies, were seen, but not universally seen. Progressive muscular dystrophies might exist with only slight muscle changes, but at autopsy disturbances would be found in the anterior horn cells and in Clark's column, in the anterior gray substance, in Lissauer's zone, which were not at all correlated to the slight muscular disturbance. In other cases at autopsy there were no spinal cord changes, but there had been marked muscular dystrophies. So far as changes in the thymus were considered that was interesting. Dr. Timme said that he radiographed all his cases for thymus gland disturbance, and in a large proportion of cases persistent thymus was observed and certain cases in early life showed a pineal shadow. Marburg had published a paper on early pineal disturbance, accompanied by abnormal fat deposits about the body. Dr. Timme thought they were coming more and more to see muscular dystrophy as a disease in which the degenerative process was dependent upon deficiency disturbances, probably in the control of some one or other or a group of the internal glandular units.

Dr. FOSTER KENNEDY said Dr. Globus had stated that in a certain number of the cases studied, the patients died from a water logging of the chest. He thought it would be interesting to know if the patient examined by Dr. Globus had such a death. He had seen a similar case in a child thirteen years old who had died at nineteen with pseudodiaphragmatic paralysis. The child suffered from acute cardiac dilatation for some three weeks before death. She had had hydrothorax, which, as Dr. Globus said, sometimes occurred. The acute cardiac dilatation was not the primary lesion, but consequent upon the overstrain upon the heart. That view of the situation might have been entirely mistaken.

Dr. Globus said he agreed with Dr. Timme's suggestion that progressive muscular dystrophy was a more generalized pathological condition than one was likely to consider it. Bunting found definite lesions in the musculature of the gastrointestinal tract, typical of the lesions found in the skeletal muscle. In one case in which the patient came to autopsy, he had found marked fatty infiltration in the liver, with no other pathological changes in the organ. The fatty infiltration was diffuse and bore no definite relation to the vascular or hepatic system of vessels and ducts. There was no inflammatory lesion or degenerative process, but some dystrophic change. The same worker reported changes in the musculature of the large bloodvessels. The changes in the liver pointed to a more generalized pathological condition in progressive muscular dystrophy. He had noted hydrothorax and hydropericardium in three cases. The finding of excessive fluid in the pleural and the pericardial cavities had led him to the study of the heart muscle. The excess in pericardial and pleural fluids was best explained by the changes in the heart muscle. Dr. Kennedy added one more to the limited number of cases studied.

Dr. Foster Kennedy said it had been common to have marked changes in the spinal cord, but he felt inclined to differ from this viewpoint. His experience had been that changes in the anterior horn and Clark's column were not common. He did not think it was common in the literature. The neural changes occurring in paralysis were identical with those occurring after amputation, which were brought about by disuse. He thought the changes in the spinal cord were secondary to those in the muscle. Considering this as primarily an anterior horn lesion, and a minor muscular disease, would render the classification of the pathology extraordinarily vague.

Dr. Globus, in closing, said that modern neuropathologists had two types of lesions to account for: degenerative and inflammatory conditions. Poliomyelitis was an example of a purely inflammatory lesion. It might have secondary degenerative processes. The primary inflammatory process was characterized, as was well known, mainly by perivascular infiltration, as in any inflammation. The cord changes in progressive muscular dystrophy certainly could not be considered inflammatory. Were they to be considered as degenerative? Every degeneration in the central nervous system was accompanied by changes in the bloodvessels and in immediate vicinity. The modern pathologist in such instances need not study the parenchyma; he studied mainly the functions and relations of the glial elements. In degenerative lesions of the central nervous system one must find cells carrying away the products of destruction in the cord. The modification in size or shape of a nerve cell was not necessarily a pathological phenomenon—it might be due to technical errors in the preparation of material for study. But the glial reaction, its accumulation of gitter cells, and other phagocytic cells in the adventitial spaces, was evidence of a degenerative process. Such changes were not encountered in the spinal cords of progressive muscular dystrophy.

A Neuropsychiatric Pilgrimage.—Dr. SMITH ELY JELLIFFE, of New York, gave an illustrated talk in which he presented some observations of personalities and of conditions concerning the work in neuropsychiatry going on in Europe following the war. He said in part:

"In 1890-1891, a year after graduation in medicine, I made my first European pilgrimage. It was a student's *Wanderjahre,* a year filled with planting, the harvests from which are still ripening. I may later speak of certain comparisons of that thirty years ago student year, spent in Vienna, Berlin, Paris, and London. Ten long good years of grind went by before my next trip—this practically was confined to Norway, Sweden, Denmark, and the Hanseatic towns. Since the year 1900, however, and the year 1910-1911, when I spent another complete year in Berlin and Paris—I had visited Europe, neurologically speaking, five times. In those ten years I had visited now one, now another neurological or psychiatric shrine. In one we did the asylums of Belgium and of northern France. In another, this time with Dr. White and Dr. Gregory, we explored the psychiatric clinics of Italy from Milan to Naples, after we had gone through a semester with Kraepelin in Munich. Though this was in 1904, seventeen years ago, I can still vividly recall the asylum in Rome just under the shadows of St. Peter's, where in two wards at least eighty patients were strapped to their beds. Such an uproar. Bedlam of the Middle Ages must have had a thriving business, for as you know it was a custom in those days to issue tickets of admission at a shilling a head, six pence for children, and show them the animals. This superstitious awe and fear, borne of folklore tradition concerning the mentally sick, is too widespread even at the present day .

"But I must hasten. My last visit to Europe had been in 1914 just before the war. This was short and was chiefly confined to the castles of the Loire:

of medicine there was little, of architecture and romance much. Still the new Pitié Hospital was just going up and Babinski's new clinic outlined, and the nurses' training school at the Salpetrière just being erected. At last, I said to myself, France has commenced to modernize her old buildings. And then came the war. In June of 1914 the wistarias of Aizy le Rideau were never more lovely, and the quiet waters of the Cher flowed under the chateau of Chenonceaux without a murmur of the gathering storm, and no whisper of the future came to my ears in Paris as I left for America in July of that eventful year.

"In May of 1921, seven years later, it was vouchsafed to me the privilege of visiting many of my old haunts and to attempt to pick up the threads that had been so rudely broken. Some never could be resumed. Fortunately new ones might be taken up, and so I shall try to bring before your eyes some of the well known faces, no more to be seen—many others still actively working in the branch of medicine, the common interest in which brings us here, and certain suggestive notions that lay along my roadway. Come travel with me in imagination and bear with my desultory remarks. In so far as I feel that we are *en famille,* I am certain that if certain gossip be uttered you will all forget it.

"I cannot go over the entire list of the losses of French neurological science during the war period, which in general is covered between 1914 and 1921, but certain very important gaps have been made. France lost at least three of her greatest men. Her sister state, Belgium, also suffered an irreparable loss. They were all older men and had each done his life work. Each stood preeminent in his sphere. Déjérine was perhaps the greatest figure of them all. I regarded him as my chief as I worked patiently with his *Anatomie* for six months in 1910 endeavoring to make good the inroads on a memory made rusty by too steady and prolonged an application to the business of bread and butter getting and nest building, and when I came to my salad period it was a delight to turn to Déjérine and Madame Déjérine to make good, if possible, these losses. I need not remind this audience what Déjérine means to neurological science. His early *Famille Neuropathique,* his *Familial Myopathy*—these are milestones in neurological progress. With Thomas, his *Maladies de la Moelle,* is a classic; his *Anatomie* in conjunction with Mme. Déjérine, and his final large volume on *Semiologie*—these are but a few of his standard performances which have enriched neurological science. I should like to speak of his personal charm, his bonhomie, his rare skill and tact in handling the neurotic patient according to his view of their disturbed emotional situations, and my own modest effort in aiding the march of psychotherapeutic progress in America through my translation of his work on psychotherapy.

"I shall return to Déjérine and more particularly Mme. Déjérine and their pupils in a moment, for I must allude to another lost leader—this time a native of Bordeaux, who has been one of the dominating figures in French psychiatry for many years—Régis. His name is familiar to many of the older men in psychiatry, as it will be recalled that his work on mental diseases was translated and published in Utica by the New York State's Hospital Press. He was a fearless and strong man. I can recall a most interesting meeting with him at Nantes. He was one of the first to be interested in psychoanalysis, and with his pupil, and now his successor, Hesnard, in Bordeaux, gave us their well known criticism of the Freudian principles. To our way of thinking this is quite academic and a criticism of words and definitions and not founded on actual experience. In a three hour conversation with Hesnard at the Grand Hotel in Paris last June I learned that neither Régis nor Hesnard had really analyzed a single patient at the time the book was written.

"In the early years of the war the death of Van Geluchten made all of us, who had known this gentle soul, mourn. His life work in Louvain had been destroyed in that mad rush of war and he himself could not survive it. We can recall the generous help that sprang from Oxford to endeavor to give him something to live for. But the blow was too deep. He could not survive an appendix operation. One can read through this attack of appendicitis and its fatal termination much more than a mere surgical case report. But of this we cannot stop to inquire.

"Our next immortal, Grasset, I first met in Montpelier many years ago. He showed me the red gown of Rabelais and the relics still guarded there at the University. He was a very remarkable neurologist and the younger men here may profit from Grasset and Rauzier's *Traite de Neurologie,* a big fat book, crowded with data and quite the equal in many respects to Oppenheim's classic.

"Having paid but short respects to the dead let us return to the primary objects of my visit, namely the annual reunion of the Paris Neurological Society—1920 had seen the first general reassemblage of that body since 1914. This leads our steps to that great Mecca of French neurology, the Salpetrière. Here at its gray and imposing portals, through which a constant stream is pouring, we see the statue of the immortal Charcot; we pass through; we notice court after court, made by the intersection of many three story graystone edifices. This, I may tell the uninitiated, is practically a city poorhouse for indigent and invalided women and it has its counterpart for men in the Bicetre, lying in a different part of the city. But it is more than just a poorhouse, it is in reality an enormous storehouse of a great variety of human ills. Here for many generations neurology and psychiatry have drunk deep of knowledge, reaching an acme in the genius of Charcot, toward whose clinic I would first direct your attention. It was here that he worked. Raymond, his successor, carried on, feebly perhaps, in view of his predecessor's brilliancy—and whose election is reputed to have been the cause of so bitter a disappointment to the brilliant young Déjérine that he had a severe depression and retired to the Bernese Oberland where Dubois's sympathy and insight worked a cure and Déjérine carried on, brilliantly, and finally reached the acme of his ambition. At his death in 1918, Pierre Marie followed him and it is to his courtesy I am able to show you an intimate glimpse of the Charcot library and collections housed in the building in which the clinical work is carried on."

(*To be concluded.*)

Abstracts from Current Literature

NEUROPSYCHIATRY.

The Diagnosis of Hysteria.—Henry Head (*British Medical Journal,* May 27, 1922) states that hysteria is a morbid mental state, accompanied by definite and specific physical manifestations and certain forms of aberrant conduct. Mimicry deceives only the ignorant observer. Not only must there be no demonstrable organic cause for the symptoms, but the positive signs of hysteria must be present to justify such a diagnosis. The term conversion neurosis denotes a mental conflict that is solved by some aberrant reaction, which removes the patient from the situation of doubt and anxiety. The physical signs of hysteria include disorders of speech (such as loss of voice and stuttering), tremors, the assumption of certain postures usually local and affecting one limb or a single joint, or both arm and leg, paralysis of the tongue, inhibition and incoordination of movement, sensory manifestations such as pain or hypersensitiveness to manipulation, hysterical anesthesias, limitation of the field of vision, visceral manifestations such as phantom tumor (gaseous distention), retention of urine, seizures and convulsions and dissociated mental states. The positive phenomena depend on three mental factors: proneness to autosuggestion, a negative attitude to orders from without, and a tendency to "dissociation." They are an irrational answer to a conflict. Fear is the most potent reason for repression. Conversion hysteria is mostly caused by a want of capacity to face failure. In the treatment, the patient should be removed from his usual surroundings and every form of persuasion should be used to convince the patient that he is capable of carrying out the action he is convinced to be impossible. His honesty must never be questioned. The attitude of the physician should be one of clinical curiosity and of human sympathy.

Functional Diseases of the Nervous System in Soldiers and Civilians.—Charles G. Beall (*Journal of the Indiana State Medical Association,* March 15, 1922) says that the first step in the treatment of functional nervous disease is the establishment of a definite diagnosis, and where this is done the confidence of the patient has been gained and then the condition should be explained in the simplest of terms and confident assurance that a cure can be obtained. The details of treatment will follow three general lines, moral, physical, and medication. A definite congenial occupation is a necessity, and even an uncongenial occupation may be made more acceptable by varying it with intervals of a change of work. . Only in exceptional cases is it advisable to have the individual stop work, and when this is necessary it should not be for prolonged periods and this applies especially to soldiers. For instance, the office man may be induced to become an amateur farmer or florist out of hours, or the mechanic may be induced to take up a correspondence course. In the case of a woman the problem is a more difficult one, and often taxes the ingenuity of the physician to the utmost. While for the well to do patient, hydrotherapy in well appointed establishments is available, much benefit can be derived from the more simple home hydrotherapy. Warm and cold sponge baths and salt baths followed by vigorous rubs can be taken in any home. The exercise and increase of moral tone induced by competitive and semicompetitive games are of immense benefit. In the gastrointestinal neuroses an abdominal support, whether it corrects a visceroptosis or has some other obscure influence is well worth trying. Of dietary modifications two are of importance. First, an effort should be made to increase the underweight individual, and correct the frequently coexisting constipation by diet rather than by drugs, though these may be temporarily necessary. A list of drugs used in the treatment of functional nervous diseases would include almost the entire pharmacopœia, and the list is being added to each year. A few nonnarcotic nerve sedatives have stood the test of time, and of these the bromides are probably the most important. In this connection it is well to remember that most potassium salts are more toxic and depressant than the salts of other metals, and had best be avoided. Our forefathers found out empirically that belladonna was of benefit in certain nervous disorders. We now have possibly more rational grounds for its use, as Eppinger and Hess have apparently shown that cetrain socalled nervous individuals suffer from a sensitization or hyperexcitability of the vagotonic system, and atropine lessens this excitability.

Evolution of the Human Intellect.—E. Elliot-Smith (*Medical Press,* June 7, 1922) holds that one of the chief aims of any attempt to interpret the evolution of the human family is the investigation of the means whereby man has acquired his distinctive characteristics, his fuller discrimination, understanding, and foresight. Darwin himself visualized how his theory would enable us to analyze the gradual acquirement of each mental power and capacity. Our knowledge of evolution has now reached a stage where the fundamental factors can be determined which gave man's ancestors the possibility to attain his specific mental powers. After reaffirming the closeness of man's kinship to the anthropoid apes, particularly to the African gorilla and chimpanzee, the author shows that the sense of smell lost its original supreme importance when the adoption of the upright position increased the usefulness of vision, touch, and hearing. These changes did not merely prove advantageous in the search for food, but they also facilitated fuller use of the hands. This gave an opportunity to develop skill in manipulation and to improve the quality of the touch sense. Correspondingly, growth and elaboration occurred in the parts of the brain concerned.

With the reduced significance of the sense of smell, the size of the snout became diminished. This resulted in a shifting forward of the eyes with a material increase in the field of useful vision. A further advance was marked by the acquirement of stereoscopic vision through the development of the complex machinery for coordinating the movement of both eyes. The climax of this evolution is represented by the perfection of the macula lutea, which makes possible the distinction of details after the eyes have been directed to, and focussed upon the object. This implies the development of the intellectual faculty of concentrating attention. As a natural consequence of these acquisitions the spirit of experimentation is called forth, and thus a fuller understanding of the nature of objects and forces is obtained.

The brain of the most primitive monkeys reveals an expansion of the area concerned with hearing and with the complex movements required for voice production. Early human skulls, such as those of the Java and Piltdown men, reveal an extensive development of these regions, a fact which suggests that the acquisition of articulate speech was an essential factor in the transformation from ape to man. The filling out of other brain areas may be traced in successive types of men, representing stages in the attainment of the fully expanded cortex of the modern European type of brain.

A Spontaneous Attack of Tetany During a Paroxysm of Hyperpnea in a Psychoneurotic Patient Convalescent from Endemic Encephalitis.—L. F. Barker and T. P. Sprunt (*Endocrinology,* January, 1922) report the case of a young man eighteen years old, markedly neurotic in type and heredity, in whom epidemic encephalitis took the maniacal form for two weeks at the outset. The subsidence of the acute symptoms was followed by a prolonged period of asthenia, during which he experienced frequent paroxysms of asthmatic breathing and slipping spells, the latter consisting in attacks of petit mal, the former being the paroxysmal hyperrespiration of tetanoid subjects. There were periods of deep and labored respiration, the accessory respiratory muscles being brought forcibly into play. The breathing was deep and regular and did not interfere materially with speech. As a rule such periods lasted from two to three minutes. While under examination a year after the acute stage of the encephalitis, a typhical acute attack of tetany occurred with bilateral carpal spasm, persisting for fifteen or twenty minutes and then passing off. It was accompanied by profuse sweating of the face and neck and by subjective numbness of the affected extremities. The feet were not involved. During the attack there was a Chvostek sign of first degree strongly positive on the right side, not quite so marked on the left. Shortly after the attack the Pool-Schlesinger leg test failed to bring on spasm of the foot.

It has been recently shown that tetany regularly occurs as a feature of voluntary prolonged hyperpnea, probably as a result of disturbed acid base equilibrium. The tetany is found to occur after decided changes have taken place in the alveolar air, in the blood, and in the urine. The alveolar carbon dioxide tension falls, the blood becomes slightly more alkaline, the urine decidedly alkaline, the plasma bicarbonate reduced, the ammonia excretion diminished, and there is a slight increase in the calcium content of the blood. The explanation given is that deep breathing washes out the carbon dioxide, disturbing the blood ratio between carbonic acid and sodium bicarbonate. A relative alkalosis develops, while still the alkaline reserve is reduced by elimination of sodium bicarbonate in the effort to maintain constant hydrogen ion concentration. The case reported is an example of such an action.

Mental Hygiene in Its Relation to Present Day Nursing.—L. Vernon Briggs (*Boston Medical and Surgical Journal,* June 29, 1922) says that psychiatry is no longer confined to asylums, prisons, and almshouses, but is one of the foremost problems of social and preventive medicine, and is playing a part in educational, industrial, judicial, and military organizations. Mental illness does not mean insanity. Mental symptoms are frequently part of the picture in typhoid, puerperal conditions, autointoxication, and poisoning. Psychiatry and psychiatric nursing deal with the individual as a whole, rather than with some particular organ. The final analysis in every case has a mental aspect which needs to be taken into consideration. The inevitable mixture of mental and physical conditions are shown in the suicides of chronic invalids, the marked depression seen in cardiac and nephritic cases, the exaltation of the hyperthyroid cases, also frequently seen in tuberculosis, the delirium of typhoid, the confusion and mental deterioration seen in brain tumors, and the hallucinations seen in toxic conditions. The mental atmosphere of the home can best be studied by the nurse, who frequently acquires an intimate knowledge of the patient's personal life, his worries, anxieties, and the problems he has to meet. With training pertaining to mental health of patients, the nurse can render reports which would be invaluable to the physician or surgeon in his task of making differential diagnosis. Hysteria, for example, may assimilate any symptom from the category of medicine, and it is only after a long period of observation by one familiar with mental reactions that these symptoms can be intelligently interpreted.

Symptom Complex of Meningitis Tuberculosa Discreta. — Nikolaus Blatt (*Wiener klinische Wochenschrift,* April 13, 1922) thinks that the symptom complex of headache of the neurasthenic or migraine type, benign pulmonary tuberculosis, and increased endocrinial pressure may be of tuberculotoxic origin, as it is associated with exudative tuberculosis of the serous meninges: the typical migraine may be based on a tuberculous foundation. A woman, thirty years old, suffering with a severe left sided eczematous keratoconjunctivitis, also showed enlarged cervical and axillary lymph nodes and a right sided benign apical catarrh of the lung. The sputum was negative for tubercle bacilli. In spite of various kinds of treatment for a year there was no relief. Two weeks after beginning local treatment of the eye the woman suffered a typical attack of migraine, with marked unilateral pain radiating to the forehead and occipital region, weakness in the extremities, a relative aphasia of short duration and hemianesthesia, a slow pulse, muscæ volitantes, positive scotomata and colored rings, stars in the visual field, followed by vomiting and then relief; there was no loss of consciousness. On instituting treatment with old tuberculin, the attacks of migraine and headache returned but became gradually less after each treatment; after the seventh injection they ceased entirely and the eye condition healed completely. If a tuberculin test in such cases results positively the treatment of the migraine with injections of tuberculin should certainly be tried.

Blood Supply of the Dentate Nucleus of the Cerebellum.—Joseph L. Shellshear (*Lancet,* May 27, 1922) shows that the blood supply of the dentate nucleus comes from the posterior inferior cerebellar artery as it lies between the medulla and the cerebral hemispheres. It passes upward between the tonsil and the lobus biventer, and enters the medullary substance to reach the dentate nucleus, where it becomes an end artery. Thrombosis of the posterior inferior cerebellar artery produces the following syndome: loss of appreciation of pain and temperature in the face on the side of the lesion, loss of pain and temperature appreciation on the opposite side of the body, dysphagia and ataxia on the side of the lesion together with analogous cerebellar lesions. In the interpretation of the cerebellar symptoms, the lesions of the dentate nucleus are usually disregarded. Some of the symptoms are due to the damage of the dentate nucleus and the resulting degeneration of the superior cerebellar peduncle and other tracts connected with it. The free cortical anastomosis may permit the escape of the dentate nucleus in some cases of thrombosis of the posterior inferior cerebellar artery, thereby explaining the variability of the cerebellar symptoms in such cases. As the artery of the dentate nucleus is an end artery, the lesion of the dentate nucleus may be of vascular origin.

ENDOCRINOLOGY.

Childhood Myxedema or Socalled Sporadic Cretinism in North America.—M. B. Gordon (*Endocrinology,* March, 1922) says that not a single case of true endemic cretinism has ever been reported in America. The socalled sporadic cretinism of this continent is really an exaggerated form of hypothyroidism, and Gordon prefers to distinguish it as childhood myxedema. Three hundred and forty cases have been reported, only four being congenital and thirty-one of the juvenile type, the rest all of the infantile myxedematous type. Geographically they do not follow lines of goitre distribution, as does endemic cretinism in Europe and Asia, but seem to occur most abundantly where the immigrant population is largest.

Congenital myxedema has as its fundamental basis the complete absence of the thyroid gland. Juvenile myxedema is the name given to those cases in which symptoms develop as the result of some acute infectious disease or nutritional disturbance at any time during childhood. Infantile myxedema includes those cases in which the pathological disturbance in the thyroid originated before birth, but enough thyroid tissue persists to enable the child to live: the symptoms are not present at birth, but develop within the first two to five years. The thyroid gland may be either atrophied or enlarged. Heredity is probably a factor of slight significance in the production of childhood myxedema. The clinical manifestations depend primarily upon the amount of thyroid present and the age of the child at the time the first symptoms appeared.

The facies and general appearance are characteristic. There is a stupid, dull look. The face is round, with low forehead and wrinkled skin, the nose saddle shaped, the alæ dilated. The ears are thick and everted. The eyes are placed far apart with narrow slitlike apertures, the malar regions are prominent, cheeks flabby and hanging, lips thick and everted, mouth wide open and drooling with a protrusion of the tongue, which is enlarged but without muscular hypertrophy. The cranial sutures and fontanelles remain open longer than normal, even up to ten years in one case. The teeth are late in erupting, are carious, brittle, short, irregular, and decay easily. The arms, legs, hands, and feet are stocky, fingers swollen, feet short and deformed, toes thickened, producing an unsteady gait, extremities cold, muscular coordination delayed. The skin is sallow and edematous. Genital development is commonly retarded, as is also skeletal ossification. Mentality ranges from mental deficiency to mental aberration. Backwardness in school is a prominent feature. Speech is acquired late; in advanced cases there is a gutteral harsh voice with incoherent speech and a limited vocabulary.

Parker makes three pathological groups, 1, absence of the gland; 2, atrophy of the gland, and 3, enlargement of the gland. Complete absence occurs only in the congenital type. The diagnosis must clearly distinguish between childhood myxedema and the minor types of hypothyroidism, on the one hand, and endemic cretinism and mongolian idiocy on the other. It differs materially from endemic cretinism in not being confined to goitrous areas, in the infrequency of goitrous ancestry and of psychic factors in its etiology, in a greater retarding of ossification, and in the shorter duration of life, few victims of childhood myxedema being found to live beyond thirty years of age. The incidence in females is twice that in males.

The treatment of this condition with thyroid preparations Gordon calls the one triumph of organotherapy that is unquestioned. Many cases are absolutely cured, others ameliorated, while still others are not influenced at all. The secret of success is early diagnosis with early and long continued treatment. Physical defects are more amenable to treatment than mental ones. The increase of dosage up to the point of toxicity, that is of acute thyroiditis, is the aim to be sought, and tolerance varies within a very wide range. Upon the appearance of untoward symptoms thyroid must be immediately discontinued, to be resumed at a smaller dose.

Malignant Tumors of Thyroid.—L. B. Wilson (*Annals of Surgery,* August, 1921) presents an analysis of the literature and a summary of the data on 290 patients with malignant tumors of the thyroid who were examined in the Mayo Clinic up to December 31, 1920. He sums up as follows:

Malignant tumors of the thyroid are much more frequent than is generally believed. Their correct clinical diagnosis is frequently missed because they may have periods of development of from five to fifteen years and patients are not followed up long enough after operation, and because not infrequently the tumor in the thyroid itself is reliatively small and the character of metastasis is not determined, owing to the rarity of necropsies. Pathological diagnosis is difficult owing to the great variation in the histology of the tumor tissue and its resemblance to that of nonmalignant processes. There has been a marked failure of American surgeons to report in the literature their cases of malignant tumors of the thyroid; this should be corrected. Insufficient observations are at hand for determining the geographic incidence. The age incidence at the date of diagnosis is greatest in the fifth decade. The distribution by sex is about one man to two women. Patients usually seek medical advice on the occasion of recent rapid growth in a long standing nodular tumor of the thyroid. Some give histories of slow continuous growth. Early thorough operations give a fair percentage of cures. Palliative operations in late cases with extensive local involvement are warranted. Pathological diagnosis must take into account the usual development of malignant tumors of the thyroid from proliferating embryonic adenomata. A series of photographs of specimens, gross and microscopic, of thirty-five illustrative cases is presented with brief clinical and pathological notes to serve as an atlas in assisting the pathologist in diagnosis. The pathologist must be thoroughly familiar with the characteristics of proliferating adenomata, as first described by Langhans, in all their stages. The pathologist must be on the lookout for the possible relationship of bizarre metastatic growths of tumors of the thyroid. The pathologist, in his diagnosis for the guidance of the surgeon, must consider the relative preponderance of proliferative and degenerative processes in the tumor, but a proliferating adenoma in a patient of cancer age should not be considered benign unless the process of degeneration is very extensive and overbalances that of proliferation.

Adrenal Insufficiency from the Viewpoint of the Clinician.—C. E. deM. Sajous (*Endocrinology,* March, 1922) in the opening scientific address before the Endocrinological Society of the City of New York, January 6, 1922, replies to a criticism by Stewart from the viewpoint of the physiologist on clinicians, those of France and Italy in particular, because of their recognition of adrenal insufficiency as a morbid factor in many diseases. If Stewart worked in the clinical field, Sajous asserts that his conception of adrenal insufficiency would not be simply that of a well marked syndrome of adrenal deficiency, for he would then take cognizance of pathological factors not to be found in normal animals. He would realize that nothing in the pathological field corresponds with the sudden enucleation of the adrenals with all other organs and tissues in the body in normal health.

In contrast with the complete deficiency of adrenal function called adrenal insufficiency by Sergent and Bernard, Sajous's hypoadrenia is a phase of acute febrile infections in which a reduction of adrenal chromophil takes place. It occurs normally in old age and at the weaning period in infants, and regularly attends overexertion at any time of life. Adrenals entirely converted into structureless masses and total extirpation of both adrenals are by no means incompatible with the continuance of life, since in human beings accessory suprarenal bodies, seemingly well able to carry on adrenal function in the absence of the primary glands, have been found in the semilunar ganglion, in the midst of the solar plexus, in the infundibulopelvic ligament, and in the testicles. On examining the testicles of newborn infants they were uniformly found by Wiesel to have the same structure that the gland usually shows. Remnants, not fully developed accessory glands, were found in older children and adults, but Marchand found organs homologous to the suprarenal bodies near the testes in man and in the broad ligaments of woman.

Among adrenalectomized animals some frogs survive a number of days and many rats for several months. The explanation Sajous finds in the presence of hematoidin crystals practically everywhere throughout their bodies, including the lungs. They have been discovered, too, after death from Addison's disease. Sajous connects the bronzing of Addison's disease with the melanin of batrachians and this product of broken down hemoglobin resulting from experimental and pathological destruction of the adrenals in explanation of the mechanism of tissue respiration. To the diffusion theory of respiration Bohr objected in 1891 that there must exist a substance having greater avidity for oxygen than the blood itself, and Haldane, Lorrain Smith, Harley, and others sustained this view. Sajous finds adrenal secretion alone capable of fulfilling this requirement. The colloid hyaline granules which constitute the adrenal secretion are contained in the blood in the inferior vena cava and so reach the heart. When this blood contains adrenin in deficient quantity, heart action is depressed, while an excess of adrenin here increases heart tone. When the adrenin reaches the lungs, it seems to facilitate the free circulation of air in the air cells by causing dilatation of the bronchioles. A variety of observations and experiments quoted show that adrenin can change venous blood into arterial blood on exposure to the air by causing its hemoglobin to be converted into oxyhemoglobin. Moreover, adrenin gives rise to all the physical phenomena of the respiratory process. It increases the intake of oxygen, the output of carbon dioxide, the volume of air breathed, the respiratory excursions of the lungs, the depth and rate of respiration. For all needs the amount of adrenin secreted is abundant, since only fourteen millionths of a gram to the kilo of body weight produce maximal effects.

In the face of this evidence supported by so great a number of observers Stewart's condemnation of hypoadrenia, as this syndrome is interpreted by clinicians, does not appear justified. There exists a large systemic reserve of adrenin from which a normal animal deprived of both adrenals can draw for as long as the reserve may last; then it shows the symptoms of adrenal failure and dies. Hypoadrenia is a gradual failure of the adrenals, which renders them unable to supply the stock of adrenin needed to carry on the function of tissue oxidation. There comes a time when, beside the symptom complex of the causative disease, there appears certain specific symptoms which are those of gradual adrenal failure—anorexia, muscular weakness progressing to paralysis, loss of tension of the eyeballs, gradual fall of the blood pressure, and steady fall of temperature till death ensues. The origin of such symptoms cannot be explained without taking into account the rôle of adrenin in tissue oxidation.

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INFECTIOUS DISEASES.

Experimental Studies of the Etiology of Typhus Fever.—Peter K. Olitsky (*Journal of Experimental Medicine,* December, 1921) reports work in experimental typhus fever in guineapigs relative to the bacteria which can be cultivated from their blood and spleen at different stages of infection. He found that the typhus virus can be obtained during the period of incubation of the experimental disease free from admixture with any of the ordinary bacteria, while coincident with the onset of the febrile reaction various bacteria are recovered, the difference in kind and the number increasing in proportion to the duration of the disease.

Later studies (*Journal of Experimental Medicine,* February, 1922) showed that the typhus virus, as it occurred in the blood of guineapigs reacting to the experimental disease, placed in a variety of media kept at 37 C., from which the oxygen is excluded by a petroleum seal, tends to die rapidly. In corresponding media under aerobic conditions the life of the virus is appreciably longer. Fourteen attempts to filter the active typhus virus present in the brain or spleen of guineapigs at the height of reaction have ended in failure. Experiments also showed that the typhus virus in the tissues of the guineapig during the height of the reaction to experimental disease does not lose its infecting power when the cells of the brain or spleen are disintegrated by repeated freezing and thawing, or by freezing and desiccating, or by crushing by mechanical means, or by grinding into a homogeneous pulp with sand. After such treatment the virus is as actively infective as in the same tissue not subjected to such disintegrating influences. Therefore the possibility exists of an extracellular condition of the typhus virus.

In the April issue Olitsky reports that in a small number of instances other effects than typhus are produced by the inoculation of filtrates from typhus infected tissues. In five of twenty guineapigs there was a rise in temperature. Four of ten animals showed the characteristic lesions of the experimental disease after inoculation of these filtrates. Still less frequently immunity to later injections of active virus was produced.

Typhus Infections Leading to Immunity in Passively Immunized Guineapigs.—E. Weil and F. Breinl (*Wiener klinische Wochenschrift,* May 18, 1922) tried to produce immunity in man in view of the fact that it is possible to produce an "inapparent" infection in guineapigs by proper doses of the virus, thereby producing an active immunity. Inapparent infections were discovered during the inoculation of typhus material in experimental animals and were recognized by the fact that the virus from animals without febrile reaction, when inoculated in other animals, produced febrile reactions in them. The requisites of an effective protective serum in man seem to be complied with, as, on the one hand, the immune serum of the guineapig has protective power in man, and on the other hand it can be assumed that that convalescent serum is effective. It has also been determined that the guineapig virus infects man. Besides, the fact that the typhus serum is effective shortly previous to the outbreak of the fever; renders it possible to increase the certainty of an apparent infection by an injection of serum in the stage of incubation. As it has been experimentally shown that agglutination toward the Bacillus X19 appears in infected rabbits which were treated with an effective protective serum, it may well be assumed that in man, treated with immune serum and the proper doses of virus, even though afebrile, the appearance of agglutination with X19 shows an inapparent infection and an active immunity. A subsequent infection with larger doses of virus would then be well borne with certainty and the immunity would be increased.

Typhus Fever Among Recent Immigrants.—Peter K. Olitsky (*Journal of Experimental Medicine,* October, 1921) obtained material for the experiments reported from a young adult female from Czecho-Slovakia, suffering from typhus fever. The blood of this patient at the Quarantine Station induced in guineapigs a characteristic febrile reaction of from four to eight days' duration, preceded by an average incubation period of nine days. The animals, killed during the height of the reaction, showed constant pathological changes similar to those found by several investigators of typhus fever of man in Europe and Mexico, and of the experimental disease in the same animal. The disease produced in guineapigs also corresponded to that set up in the same species with the human and louse strains of the Polish virus. The experimental disease was capable of transmission through at least nine successive animals. Specific immunity reactions were demonstrable. As a result of this study Olitsky states that he has experimentally demonstrated in the guineapig that the blood from an infected Czecho-Slovakian arriving at the Port of New York from Italy contained the virus of typhus fever, and that this strain is identical with the epidemic virus in man and louse in Poland.

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Mental Disorders Following Traumatism*

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Traumatism may be followed by mental disorders of a wide range. Extreme mental enfeeblement and neuroses, also considerable varieties of purely psychic disorders, have been observed. Among the latter confusion occupies a conspicuous place. Depression of all degrees, amnesia, slowness of psychic functions, confusion, delirium, epileptic phenomena, and paretic phenomena—have all been observed between the two extremes of the pathological chain.

The entire series of 126 cases presented the following groups: twenty cases of a confusional state; twenty-five of amnesic phenomena of various degree; twenty-five of depression, seven of epilepsy, nine of paresis, thirty of neuroses, and seven of progressive mental enfeeblement. Each of these groups presents many important features and therefore deserves a special description.

CONFUSIONAL STATES.

In this group the traumatism was chiefly cranial without fractures of the skull in eighteen cases. In the remaining two cases fracture occurred. The general characteristic consisted in a manifest want of harmonious equilibrium between the psychic and organic functions. The loss of consciousness which followed the traumatism in all the cases lasted a more or less long time. Irrespective of the duration of the comatose state, the patients eventually presented the following clinical picture: Narrowing of the faculty of perception and of comprehension; disorientation in time and space. In addition to the confusional state some of the patients presented considerable abatement and sadness, they showed a tendency to move about aimlessly and in an incoordinated manner. Some of them had delusional ideas of an expansive character with and without hallucination. But what was especially striking was the nebulous state of the brain against which the patients themselves endeavored vainly to react. The intensity of all these confusional manifestations was in some relationship with the intensity of the traumatic shock and its coma.

The clinical picture just presented was a subsequent and eventual development. But in the brief period following the accident the psychic manifestations were of considerably less intensity although their character was identical with those of a later or ultimate period. One finds a restriction of the field of consciousness with its usual characteristics, viz., a certain degree of amnesia, diminution of the power of perception, and of that of comprehension. During this phase one observes not infrequently delirious outbreaks particularly in individuals with an alcoholic or neuropathic history. In the cases with a morbid hereditary history the initial phenomena invariably deepened more and more progressively and terminated in the condition depicted above. From a prognostic viewpoint it is interesting to note that eventual (although at a late date) recovery followed in those cases in which no neuropathic or special hereditary factors could be revealed. In one case, however, where the patient had a fracture of the skull and for many months there was a pronounced disorientation with amnesic phenomena and finally in whom alcoholism was much pronounced—complete recovery followed. In this particular patient close investigation showed that he was the son of exceptionally healthy and normal parents whose other children were all of high professional and intellectual standing. Alcoholism was present in the patient as the only member of the family of good stock. It suggested the idea that hereditary morbid influences are more potent than those acquired in adult life.

It was mentioned above that the intensity of the confusional elements was somewhat dependent upon the intensity of the trauma and of the coma. It is well to mention that this direct relationship is applicable to the cases which presented no morbid history in the personal or hereditary antecedents and which made a complete recovery. On the other hand in the cases with unfavorable antecedents there was no relationship between the intensity of the trauma and the degree of mental phenomena. Slight traumata in the latter group were followed by pro-

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nounced and serious psychic disturbances, while in the first group grave traumata with prolonged coma produced at first apparently grave manifestations but later recovery followed. All of the characteristics of Korsakoff's syndrome were presented in the following case:

CASE I.—A. O., a man aged thirty-nine years, laborer, although addicted to frequent use of alcohol, was nevertheless mentally clear. Accidentally he was run over by an automobile and sustained a fracture of the skull. An examination, several days after he recovered from the comatose state, revealed the following condition: retroanterograde amnesia, confabulation, and illusions of identity.

The impaired memory was most pronounced, the patient was unable to tell where he was and where he came from. The confabulation was of a great variety. Stories concerning his several marriages to daughters of kings, his participation in important international affairs—have all figured in his extreme talkativeness. The illusions of identity concerned all persons who spoke to him or who were present in his room. He recognized in them mostly forgotten or dead relatives.

The patient also presented a tremor of the hands, lips, and tongue, heavily coated tongue, tenderness over the hepatic region; he complained of headache and cramps in the legs. Besides, in the evenings, he presented visual hallucinations of a mildly terrifying nature, which disappeared in the morning.

Somatically he presented symptoms of a basal fracture: there was palsy of the right facial nerve, bleeding from the mouth and the right nostril—a condition verified by an x ray examination. After passing through several phases of amelioration and regression the patient eventually recovered. This case is placed in the group of posttraumatic confusional states because of a certain relationship of Korsakoff's symptoms to confusion or rather because of the interpretation of those symptoms by some authors as being essentially confusional in character in view of the fact that disturbances of the perceptive faculty is the fundamental disorder of confusional psychosis. In reality, however, in Korsakoff's syndrome the faculty perception is limited to only a few manifestations, while in confusional insanity the perceptive power is generalized and as a rule more profound.

AMNESIA.

Twenty-five patients presented amnesic phenomena of various degrees. In the majority of patients there was a direct relationship between the intensity of the traumata and that of the memory disturbance. In two cases, however, with fracture of the skull in one, and several fractures in the long bones with considerable loss of blood in the other, also with loss of consciousness in both cases, there was no profound disturbances of the mnemonic faculties. The amnesia existed only with regard to circumstances close to the time of the accident. Both patients made a complete and prompt recovery. The amnesia in this group followed a brief period of mental hebetude which left no elements of confusion. The amnesia existed without any other psychic manifestation and the patients were fully aware of the impairment of their memory. Retrograde amnesia was more frequent than anterograde. In some cases it was anteroretrograde. In the retrograde variety the memory was affected even with regard to events of the most intimate character which had occurred months and years prior to the accident, such as, for example, concerning marriage, family relations, names of the nearest relatives. Complete recovery followed in all the cases, but the process of recovery was fractional. Events came back to the patient's memory very gradually.

The most interesting feature lies in this striking fact that not only the amnesic phenomena existed alone and were the only psychic disorder, but also that their duration was of a prolonged character. The awakening of memory, one may say, took place in one event after another and in centripetal course it brought back facts to the period of the trauma and thus eventually filled the gap in the field of consciousness.

DEPRESSION.

Twenty-five patients presented all possible degrees of mental depression. After a more or less brief period of disturbed consciousness following the trauma which did not happen to produce a fracture or any other organic lesion of tissues or organs, an asthenic state developed in the patients. During this state mental depression developed. The latter presented all varieties, from mere sadness to profound dejection with ideas of hopelessness. In the former the patient was still able to attend to his daily routine duties, but ceased to find former enjoyment in his work. In the latter the picture was that of melancholia with its delusive ideas usually leading to attempt at suicide. It was interesting to observe that the melancholia patients, five in number, had analogous attacks before the trauma occurred, and furthermore, after the recovery from the posttraumatic attacks they continued having recurrences during the following several years of observation. On the other hand the patients whose previous histories showed nothing abnormal, made a total recovery. It is also instructive to note that the milder the depressive manifestations were, the longer was their duration. The recovery in all the cases was not sudden or even rapid. It took place by gradation.

The problem of the pathogenesis of mental depression following trauma (without organic lesions) presents two aspects: one which may be of a metabolic character when the organism presumably absorbs noxious elements derived from the endocrine system, the other may be of a psychogenetic nature. The individuals observed during the asthenic state manifested, possibly because of the latter, a hypochondriacal condition of greater or lesser intensity. Some of them saw in their posttraumatic phase a grave injury which may eventually lead to serious mental disorder. Some considered themselves hopelessly damaged. Some believed that while their injury is not absolutely incurable, nevertheless it is of long duration which means incapacity and therefore great financial losses. The fact itself that they were conscious of their depressed state led some to abandon themselves to interpretative reflexion of the most pessimistic character. During the many months of their depressed state many individuals, in spite of being conscious of it, made heroic efforts, but vainly.

to view their condition as a mere failure of adaptation. Their mental state was manifestly the result of failure in properly interpreting the effect of a trauma which does not cause organic disturbances. The fear of a possibly serious disease was so overwhelming that a state of depression was bound to follow. Educative measures undertaken for the removal of the faulty interpretation brought satisfactory results, an excellent illustration of the psychogenetic origin of the mental disorder under discussion.

EPILEPSY.

The seven patients of this group sustained traumata of various intensity but without fracture of the skull or laceration of cortical tissue. Their epileptic attacks could not therefore be considered as a result of a material lesion of cerebral substance. Besides, their convulsive seizures were not of a focal but of a generalized type. The relation, as cause and effect, between the convulsions and the trauma, is one that presents great difficulties for solution. A careful inquiry into the personal and family histories of each of the seven individuals revealed a wealth of information leading to a better understanding of the above mentioned relationship. It was found that four patients were syphilitics, as proved by the positive Wassermann test; two patients had convulsive seizures until the age of puberty, and some relative epileptic histories. One patient presented an absolutely negative history.

The syphilitic patients were all of middle age. From the time of the traumata the convulsive attacks continued for several years during the periods of observation. Three of them had major attacks, one had petit mal. The attacks developed shortly after the trauma and were preceded by severe headache during a period of from ten to twenty-five days. The inference is that the trauma was the provocative irritating agent for a cortical irritation in luetic bloodvessels.

The other two patients were free from epileptic attacks beginning at the period of puberty until the age of twenty-five and thirty respectively, viz., to the dates of the trauma. Epilepsy made its reappearance immediately. Their traumata were quite violent, one fell off a scaffold, the other struck his head against iron in a collision of two cars. There was a slight loss of consciousness in both cases. The trauma here apparently has the same influence as alcoholism. Not all persons who drink or sustain traumata develop epilepsy, but in these two cases trauma could be considered as a determining factor in individuals possessing a predisposing makeup for cerebral manifestations of a pathological character.

The last patient of this group was a man of twenty-five, whose blood and spinal fluid gave a negative Wassermann reaction, and whose personal and family histories were totally negative. Epileptic convulsions developed five days after a severe trauma of the head caused by falling off a moving train. There was loss of consciousness for two hours. X rays failed to reveal a fracture of the skull. The man was able to be about in a few days. The convulsions were of a generalized type and there was no evidence of a focal lesion.

During two subsequent years the epileptic seizures occurred eighteen times. The question arises as to the pathogenesis of the epilepsy. The only admissible inference seems to be that very small hemorrhages occurred in a diffuse manner over the cortex of the cerebrum during the concussion of the brain.

PARESIS.

Loss of consciousness was present in all of the nine cases. The trauma was cranial but without fracture. Five patients commenced to show signs of paresis about two months after the trauma, four patients in four months. Physical signs were the first to appear, viz., tremor of tongue, of lips, of hands, ataxia of gait, and the characteristic speech. The mental manifestations rapidly followed. It was interesting to note that the latter rapidly followed the former. During the intervallary period between the trauma and the appearance of the paretic symptoms the patients complained of vertigo and headache, there was also a change in character and in general fitness especially for performing occupational work. The subsequent course of events was that of typical paresis. In eight patients the Wassermann reaction was positive in the serum and cerebrospinal fluid, but in one case repeated examinations of both fluids gave invariably negative results.

At present the consensus of opinion is that paresis has syphilis as the only etiological factor and that no syphilis means no paresis. How to reconcile the fact that paretic symptoms commenced to be manifest from two to four months after the trauma in the first eight cases of the group, while before the trauma according to the statements of relatives there was not a single indication of paretic manifestations? Does the traumatism fulfill all the requirements deserving to be considered as a determining factor? The answer to all these queries may be only one. In view of the fact that the Wassermann reaction was positive in every one of the eight cases, we therefore deal with syphilitic cases. Assuming that the statements presented by the relatives as to the nonexistence of paretic symptoms before the trauma is correct, the only presumption is that the trauma activated so to speak the preexisting syphilis and hastened the cerebral extension of the latter in the form of paresis. It must also be borne in mind that there is no record in the literature in which paresis could be more associated with a trauma of other parts of the body than in cranial traumata. In the latter case there are always symptoms of cerebral concussion which means involvement of the encephalon and its centres. Cranial traumata in such cases are no small factor and in spite of the positive serological factors in paresis trauma does play a certain rôle. In estimating the latter special attention must be given to the intervallary period between the time of the trauma and the first appearance of paretic symptoms.

A statistical study of the cases reported shows that the interval is usually from two to thirty months and only in a few exceptional cases it was several years. The existence of morbid phenomena during that time is of considerable importance. They are: intense headache, vertigo, change of character and occasional convulsive seizures. Among them headache deserves special attention. Occasionally there may be immediately after the traumatism a confusional state with or without hallucinations, but it usually subsides and soon disappears. Vertigo and headache ordinarily commence very soon and shortly after the effects of concussion have worn off. Epileptiform attacks are an important symptom, as they are an undoubted evidence of a cerebral lesion. One may therefore say that the intervallary period with cerebral symptoms during a period of two to thirty months points to a valid relationship between traumatism and paretic dementia. Above that period a relationship may still be considered provided the persistent headache, frequent attacks of vertigo and of epilepsy existed during the entire period from time of the trauma.

The last patient of this group presented in about two months after the trauma a diminution of intelligence and a gradual transformation of the personality. The character, the affectivity, the relation to surroundings—all were undergoing decided changes. At times a delirious state would make its appearance, but it never was of a prolonged duration.

Physical symptoms were present. Tremor, difficulty of articulation of words, pupillary changes—all were distinctly manifest. Otherwise speaking, the clinical picture was strongly similar to that of paresis. However, at the end of five months all the symptoms commenced to decrease in intensity, gradually reached a considerable degree of amelioration and became arrested in its progress. The patient resumed his former occupation of a clerk in a hotel. Such a course of the disease is diametrically opposite to that of paretic dementia which is invariably progressive. In our case the onset of the symptoms was stormy and pronounced, but their evolution was retrogressive. Our case is therefore not one of genuine paresis but it could be considered as one of pseudoparesis, analogous to cases which we observe in alcoholism. The relation of traumatism here to the pseudoparetic symptoms is extremely difficult, if at all possible, to be established. The trauma caused here a concussion of the brain which very probably was due to diffuse minute hemorrhages and set up an acute meningoencephalitic process without intervention of lues. As it was mentioned above, the serological test on several occasions proved to be negative.

The medicolegal phase of paresis or of pseudoparesis after trauma is of great importance. The reader is referred to the concluding pages of this work.

PROGRESSIVE MENTAL ENFEEBLEMENT.

The injuries sustained by the seven patients were mostly in parts other than the cranium; in two cases only the injury was to the head; although it was severe, the x rays failed to reveal a fracture. Loss of consciousness was present in the cranial but not in the peripheral injuries.

The ages of the patients range between twenty-five and forty. The cranial cases were of twenty-seven and thirty-two years of age respectively.

The latter two cases presented clinical pictures of dementia præcox. One finds here an early period of a mild depression with symptoms of asthenia. The latter is not a constant phenomenon; it is paroxysmal and alternates with brief periods of excitement. Gradually but progressively set in: indifference, apathy, and indolence. Hypochondriacal ideas make their appearance. Later on one observes a morbid laughter of an explosive character and without an emotional element, grimaces, fugues, negativistic tendencies, disturbances of demeanor and conduct, etc. What is particularly instructive from a diagnostic viewpoint is the rapidity of development of these symptoms and particularly an acute attack of confusion appearing almost immediately after consciousness has returned. The confusional state does not differ from identical states following other etiological incidents than trauma, so that it is impossible for some time to predict an oncoming dementia præcox.

More interesting and difficult of interpretation are the cases in which dementia developed following injuries to the trunk and extremities without evidences of cerebral concussion. The histories of the five cases present a remarkable similarity.

One example may be cited for illustration demonstrating the fact that the dementia here is not that of dementia præcox or of paretic dementia.

CASE II.—M. L., merchant, aged thirty-seven, fell off a train and fractured five ribs and both femurs. According to information obtained, he was confined to bed for seventeen weeks. On the third week after the injury he commenced to be depressed: he would speak little and his memory became poor.

He came under my observation six months after the trauma, and the following condition was found: He was apathetic and indolent, had a vacant look; did not converse, but uttered to himself unintelligible sounds, smiled feebly but without a cause. When spoken to he was disoriented and looked at me with a surprised expression. He was always found as if he were deep in his thoughts. His field of consciousness was crowded with mental representations of the past, which he was unable to connect with each other by reason of contradictory thoughts and images and for the same reason when he spoke he did it in an incoherent manner. He did not recognize well letters and words, was unable to calculate; he made mistakes in the ages of his children and did not recall easily their names.

His attention became rapidly fatigued. His orientation in time and space was deficient. His general attitude was childish and foolish; he did not realize at all his situation: asked how he felt, he answered: very well and he was here to amuse himself.

The patient showed accentuation of this condition two years after its onset. At the time of writing these notes incontinence of urine had developed; he had to be fed, as otherwise he put his hands in the plate. From a neurological point of view the patient presented nothing abnormal: his reflexes, pupils, motor and sensory apparatus—were all intact.

The case is therefore one of a progressive mental enfeeblement, which has not the characteristics of paresis or of dementia præcox, and which developed in a person free from a luetic infection (as proven by negative Wassermann tests), and apparently in the midst of perfect health but following a trauma of parts other than the cranium.

The possibility of posttraumatic dementia is particularly important from a practical viewpoint. Totally different from paretic or precocious dementia, it is not accompanied in the beginning by symptoms of cerebral concussions nor by immediate emotional manifestations. From the etiological point of view should a traumatism be considered as an incidental or as a determining factor in the causation of dementia? A person in whom dementia præcox develops is one with a psychopathic makeup.

It does not require a special mental stress to conceive such an occurrence in cases of cranial injuries. The pain more or less prolonged, the insomnia, loss of appetite, the state of anxiety—all have its exaggerate impress on a person whose psyche is constitutionally abnormal. Hypochondriacal ideas, false interpretations, genuine delusive ideas, illusions, hallucinations—all are likely to develop *à propos* of a severe trauma when the soil is receptive.

In injuries of the peripheral parts of the body we saw developing a dementia of a different type. It is equally possible to understand its development in cases of prolonged suffering leading to a state of preoccupation, of impatience, of anxiety about the outcome and of a persistent emotional attitude. This gradually leads to sadness and depression and if the patient belongs to the predisposed type, his depression is likely to become more and more pronounced and on such a basis a psychosis may readily be grafted. A study of the antecedents of the patients of this group permits placing them in the category mentioned. The conclusion to which these observations lead is that a trauma may be considered as an exciting factor in the causation of dementia, but the question of why in some cases one form of dementia, and in others another form—remains still open. One may, however, remark that dementia præcox may develop after injuries of the cranium more readily than after trauma of any other part of the body.

NEUROSES.

Although the title of this work is concerned with mental disorders, nevertheless neuroses may be included by virtue of the fact that psychogenetic factors are essentially the underlying cause. If one only bears in mind that hysterical manifestations are due to a split or a dissociation of personality, one will understand that in a large number of cases the line of demarcation between neuroses and psychoses can not always be sharply established. Under post-traumatic neuroses will be here understood morbid states following traumatism which could not be associated with anatomical changes of the central nervous system.

Neuroses englobe a vast variety of manifestations. In one variety one finds local symptoms: In the motor sphere there may be a flaccid paralysis or a contracture. In the sensory sphere one may witness an anesthesia or else a hyperesthesia. Trophic disturbances may accompany either. What is characteristic is the strict localization of the disorder to the region which sustained the trauma. In another variety one meets no more with localized disorders but with a condition showing a generalized disturbed functioning of the nervous system. The patients will complain of persistent insomnia, vertigo, headache, nutritive disorders, and mental fatigue. There will be noticed a slowness of mental processes, an impossibility of retaining impressions. In a third group one finds local and general manifestations.

The characteristic variability is seen not only in the manifestations themselves, but also in the time of their appearance: in some cases the traumatism is followed immediately by a group of symptoms; in other cases the morbid phenomena develop gradually; in still others they will appear after a more or less prolonged interval. The same characteristic is applicable to the trauma itself: In some of my cases the trauma was insignificant and still the manifestations were pronounced: a persistent tremor, for instance, developed in one arm which during the patient's fall from a scaffold was not even injured. In another case a flaccid paralysis developed in one leg following a fall on an icy pavement—five hours following the accident: the reflexes were normal, the resistance of individual muscles of the limb was normal. The paralysis persisted during nine months, and the recovery was sudden. One of the reasons of the maintenance of the disorder was reading an account of an accident in which the patient became a cripple after a fall. In other cases an unfortunate suggestion coming from an enterprising attorney will maintain a functional disorder until after a litigation. In two cases of the present series a persistent contracture of the right arm and leg gave the attorneys a desire to insist upon the existence of a hemiplegia caused by a cerebral hemorrhage during a sprain of an ankle in getting off slippery steps of a street car. The organicity of the disorder disappeared with the settlement of the two cases.

In analyzing the genesis of the functional nervous disorders one must always bear in mind a psychogenetic factor which can be revealed by psychoanalytical methods, and recovery may follow. One must also be mindful of the existence of cases in which following a shock of the nervous centres during a violent traumatism, very fine cellular alterations may take place. Indeed such findings (1) have been observed in a certain number of instances, which during life presented, in a general way, the clinical pictures of traumatic neuroses. Errors may occur in the diagnosis of traumatic hysteroneurasthenia. On the other hand, one must not forget that a hysterical individual may be a conscious simulator and in monosymptomatic cases of traumatic hysteria errors of diagnosis may occur. Repeated examinations, however, will prevent confusion of functional with organic cases.

There is a type of cases which does not enter into the category of hysteria or neurasthenia, but forms a unit apart and presents a veritable psychosis which could reasonably be called *vindication psychosis,* but without delusive ideas (Roux). It is a condition which very frequently occurs in traumata and which is frequently a source of endless litigation. Brissaud (2) very aptly gave it the name *sinistrose,* meaning a sinister way of thinking and acting. Nine such cases occurred in my series.

A description of one of them will give a fairly good idea of the nature of the disorder which warrants me in classifying it among the cases of the present chapter.

CASE III.—A. R., aged forty-five, a tailor, sustained a fracture of several ribs, by falling into a manhole on a dark street. Alarmed because of severe pain, his sole thought was at first to get well.

Soon, however, he improved, slept and ate well but still was confined to the house. He then commenced to analyze his situation. "I could have easily lost my life," reflected he, and "who is at fault? Here, I am confined to the house without substantial means for my wife and children. The city should pay for my losses at present and for the future, as who knows how long my disability will last. My doctor assures me of complete recovery but he does it only to console me; I know it will be a long siege and perhaps it will incapacitate me for years; a neighbor of mine never recovered from an accident."

Later on, when recovery became almost complete and all the vegetative functions became normal, my patient became alarmed at the prospects of being obliged to resume his work.

"I am too weak to commence my work," said he to his physician who continually kept on calling his attention to the interrupted progress in his condition.

A struggle commenced, on one hand he felt that his physician was right, on the other hand he feared losing a substantial sum which he felt he could collect from the municipality.

And then, "supposing his physician made an error and that he will never regain fully his former health." Finally the patient went to work. He found that he lacked the former capacity, felt discouraged at the thought that other men of his acquaintance recovered large verdicts. It was foolish to continue working, he stated. He went to another physician who was accommodating and said that he was not fit to work. A ray of hope struck him: he went to a lawyer who became very solicitous, advanced him some money, and promised success in collecting a large amount from the municipality. He was now sure of victory.

Such is the picture of the interesting psychosis, *sinistrosis.* The essential elements are purely psychic and if an analogy can be built, it resembles strongly obsessive states with fixed ideas. Somatically my patient presented nothing abnormal: there were no stigmata or other manifestations of hysteria, there were no disturbances of vegetative functions during the process of interpreting his condition. Sinistrosis may present itself in pure form similar to the case described but also in an associated form. In another case of the same group a man passed through the same process of thinking concerning his shoulder joint on the right. There was a laceration of the deltoid region which healed up perfectly, but the patient kept on holding the joint immobile against all advice of his physicians and thus produced a rigidity. In hope of getting a large remuneration from an insurance company the patient suggested to himself that his affection was serious and thus unconsciously maintained his condition. Persons in whom psychotic states of this character are apt to develop are constitutionally abnormal. It requires a special predisposition to be able to convince one that an organ or tissue is diseased while it is in a normal condition, to prefer remaining idle and waiting an indefinite time for compensation instead of resuming immediately the daily work in which alone a normal man can find contentment and happiness. It seems rational to admit the existence in such cases of a certain degree of mental degeneracy or at least of a certain amount of predisposition to morbid mental manifestations. This logically leads to the consideration of management of such cases, but this phase of the subject is not within the scope of the paper.

MEDICOLEGAL PHASE.

The study of the relationship of traumata to mental disorders presents many difficulties. Let us consider seriatim each of the group.

We have seen that in eighteen cases out of twenty of the confusional group there was no fracture of the skull. Consciousness was lost in all the cases. We have also seen that as a rule there is no relationship between the intensity of the trauma and the intensity of the confusional state particularly in cases with unfavorable antecedents. These facts are important from a legal standpoint as they show the possibility of a confusional mental disorder to be caused by a trauma of any degree.

In posttraumatic amnesia the jurist must recognize the fact that loss of memory may occur after an accident, that it may be very slight or very much pronounced, that it may relate to facts preceding the accident or following it, that amnesia may exist alone without any other mental manifestation and finally that amnesia may be of an indefinite duration.

That an accident may be followed by all degrees of mental depression which sometimes may be so deep as to present a typical psychosis of melancholia with its attitude of despair and hopelessness leading to suicide, is an established fact. In estimating the influence of trauma inquiries should be made as to the existence of attacks of depression prior to the trauma. In such cases the trauma plays the rôle of exciting factor. It means that the given patient may not have had an attack at this time were it not for the trauma. It should also be borne in mind that trauma *per se* is likely to produce an asthenic or depressive state in individuals who never had such a condition prior to the accident, also that this state may last a more or less prolonged period.

Epilepsy may follow traumata. The cases of this series show that in every such case inquiry should be made with regard to syphilis or alcoholism also to a previous history of convulsive seizures. In all such instances the trauma could be considered as an exciting factor. The cases also show that a fracture of the skull is not a necessary requisite for causation of epilepsy. Epilepsy may also make its first appearance after a trauma in patients free from syphilis and alcoholism, as one of my cases proved. Here the trauma was the point of departure and the patient who formerly had no epilepsy continued having it during the two years following the accident. It is to be presumed that in all such cases concussion of the brain with small hemorrhages occurred. From a judicial viewpoint this knowledge is important.

The determination of the rôle played by a trauma in paresis deserves special discussion. In the eight cases out of nine Wassermann reaction was positive. Syphilis therefore must be taken into consideration. On the other hand severe traumata occurred and shortly afterwards the paretic symptoms began to show themselves. Considering the nature and course of the manifestations in this progressive disease one must admit that when the disease develops rapidly or immediately after a trauma, one deals here with a case of latent paresis masked by the trauma. When the symptoms commence to appear at a late date, several months after the trauma for example, a strong relationship between the latter and paresis can be established only if during the intervallary period certain morbid symptoms (see above) were present and remained persistent, showing that the brain was involved during the accident. In this class of cases trauma has a powerful influence as it produced the intervallary symptoms which in reality never disappear but gradually lead to the typical picture of the disease. It must, however, be added that in spite of the evident effect of trauma on the disorder of cerebral function *per se,* it is unable to produce paresis unless the patient is luetic. Considering the fact that not all luetic individuals become paretics, also that the latter present a very small proportion among all cases of syphilis, it becomes evident that the influence of trauma is not a negligible factor.

When on the other hand paretic symptoms appear immediately after the trauma, the rôle of the latter is slight but nevertheless it is existent and it could be considered as a revealing or as an accelerating and intensifying factor in the evolution of paretic manifestations. In such cases the disease existed undoubtedly prior to the trauma. The legal decisions can safely be based on these premises.

Other forms of dementia than paretic may follow traumatic injuries not only of the cranium but also of other parts of the body. We have seen that in injuries of the skull dementia præcox develops more readily than in traumata of any other part of the body. Mental enfeeblement may gradually develop after an accident to any part of the body especially in neuropathic persons. In such cases prolonged suffering, anxiety about the outcome of the injuries, the persistent emotional state, are powerful factors in causation of sadness and depression and eventually a progressive mental enfeeblement makes its appearance.

In the chapter of neuroses following trauma a brief description was given of hysteria and neurasthenia. The objective symptoms of the first and the subjective complaints of the second will have to be thoroughly investigated and solidly established with regard to their existence before the trauma. It is a common observation that they may develop following accidents. The relation of trauma to neuroses is firmly established. The emotional element associated with any accident is likely to set up a series of functional disorders in the psychomotor, psychosensory, vegetative and mental spheres, also in the special sensorium. Of far greater and more important legal interest is the socalled psychosis of vindication upon which I dwelt in the respective chapter. We have seen how the particular mental state develops, how much the surroundings, agents, attorneys, and other interested persons help with their council to maintain indefinitely the socalled sinister state of mind in the traumatized patient. By virtue of this special feature it will serve in the interest of the plaintiff and the defendant as well as in the interest of the community to legally dispose of cases of this character as promptly as possible. It is extremely important to remove as speedily as possible such persons from the obnoxious milieu of ill advisers, thus neutralizing their ill suggestions, avoiding the maintenance of a psychosis which, if not remedied, may become deeper and deeper and thus there may develop a condition which will be a heavy burden to the community.

Remaining exclusively on medical grounds in which preventive measures are of utmost importance, and bearing in mind the underlying psychological elements of the socalled vindication psychosis, one can only indicate the proper directions for avoiding mental collapse but it is for judicial and legislative bodies to make final decisions.

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General Management of Acute Injuries to the Brain*

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The suggestion with reference to the general management of acute injuries to the brain herein presented were gleaned from my observations made upon some fifty odd cases treated during the past two years. The discussion will be restricted to cases of brain trauma, excluding those produced by gunshot wounds and depressed fractures. The latter are usually readily diagnosed and the question of surgical intervention and the methods employed are universally recognized.

The brain, as is well known, is an incompressible structure suspended, as it were, within the bony framework of the skull by fibrous partitions, namely, the falx cerebri and the tentorium. These structures, together with the dural processes, bloodvessels, and the cranial nerves hold it relatively immobile at its base. The brain is surrounded by a small amount of fluid in the subarachnoid spaces and in its ventricles which are continuous with these spaces. To repeat, the brain is an incompressible mass and its bulk can be reduced only by a loss of its fluid constituents. If compressed in one direction it naturally must expand in another. So, it is seen, that a clear understanding of the physiology of cerebral compression is absolutely necessary to the proper management of brain injuries and upon the recognition of the effects and the measures employed toward its relief, the immediate as well as the remote outcome of the case may depend.

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The study of intracranial trauma actually resolves itself into a thorough understanding of the cerebrospinal fluid and the estimation of the presence or absence of an increased pressure should be the first information sought for in a given case. It is now known, largely through the researches of Dandy of Johns Hopkins, that the cerebrospinal fluid is secreted almost entirely by the choroid plexus which is situated in the two lateral, the third and fourth ventricles. The ventricular system is continuous, each chamber contributing its portion of the fluid. From the fourth ventricle, the fluid passes by way of the foramina of Luschka and Magendie into the cisterna magna and this in turn communicates with the entire cerebrospinal subarachnoid space which intimately covers every portion of the central nervous system. The fluid, therefore, comes into close contact with the minute capillaries and from the subarachnoid space it is taken up by way of the venous channels and thus absorbed. Furthermore, it is known that under normal conditions the pressure of the cerebrospinal fluid is the same as and varies with the pressure in the venous sinuses and the rate of production and that of absorption must be constant if an equalization of pressure is to be maintained. Its constancy, therefore, depends upon the amount of fluid present, upon the arterial tension and upon the pressure in the venous circulation. Any interference with the circulation in the venous channels resulting in a lessening of the absorption of the cerebrospinal fluid produces an increase in the fluid pressure. This increased pressure, or in other words cerebral compression, may be produced by a variety of lesions, chiefly among which are, namely, a congestion of the meninges, hemorrhages into the subdural subarachnoid and subcortical regions and extradural clots. From the foregoing it is seen that any increase in the intracranial pressure must have its effect upon the entire central nervous system, the transmission being by way of the subarachnoid spaces, the cisterna magna, and the cerebral ventricles. The nervous structures are consequently compressed or squeezed and likewise the bloodvessels are pressed upon with the resultant anemia, lack of oxygen, and edema. Signs of fracture of the skull and symptoms of injury to the brain, while independent in one way, are moreover intimately associated in their etiology so that occasionally one may be a help in the diagnosis and treatment of the other. For instance, the demonstration of the site of the greatest bone injury may give one a clue to the region of the brain which requires the most attention. On the other hand it must be remembered that the brain may be contused against the rigid walls of the skull and dura at more remote places.

It is not infrequently the case, however, that the first thought of the surgeon who attends a patient who has received an injury to the head is confined exclusively to determining whether or not there is a fracture of the cranial vault. This, if considered alone, except in compound and depressed fractures, may cost the patient his life or at least markedly diminish his chances of recovery. Symptoms do not develop in patients nor do they succumb from the fracture which may or may not be present, but symptoms do develop and patients do die as a result of the intracranial trauma and the increased intracranial pressure.

Certain general signs and symptoms give us invaluable information as to the character and the severity of the injury and are therefore great aids in directing our treatment. The most important of these general signs and symptoms are: the character and rate of the pulse, the temperature, blood pressure, respirations, eye grounds, and the determination of the cerebrospinal fluid pressure by the mercury manometer or some other suitable instrument.

Careful watching of the pulse, together with other physiological signs, is of the greatest value in some cases. A slowing of the pulse rate may appear very early in the severer types of cerebral injury if the vasomotor mechanism is reacting properly, but in most cases the slowing down of the rate occurs more gradually, during the first ten or fifteen hours after the injury, when it may become as slow as fifty beats to the minute or even slower. In the most severe cases, on the other hand, there may be a very rapid pulse from the very beginning, a pulse which never slows but which becomes faster and faster until the final stage of cerebral compression is reached and life is extinguished. In this condition the injury is presumably so great that the physiological reaction to compression is simply passed over and the terminal stage is reached at once. In other cases an initial rapid pulse may be followed by a reaction on the part of the organism with a resulting slowing of the pulse rate and with perhaps an elevation of temperature and arterial tension along with other signs of cerebral compression. Then, too, a slow pulse may accompany insignificant brain injuries and may persist for a long time after the patient's general condition has become normal and he has left the hospital. One must not, therefore, place too much stress upon the pulse alone without other signs of manifest compression. A slow pulse, *per se,* should not be considered sufficient indication for operative relief of pressure. It was our practice to order that the pulse be taken and recorded every half hour for the first ten or twelve hours immediately after the injury and then every hour for the following ten hours.

No hard and fast rules can be laid down with reference to the temperature reaction on the part of the patient, but in general there is at first a fall in temperature immediately after a brain injury. This rises to normal or above during the stage of reaction. It has been said that the height to which the temperature rises seems to be largely if not entirely dependent upon the extent of the cerebral damage, the greater the contusion, the higher the temperature.

Like the temperature, the blood pressure usually falls immediately after the injury and if the outcome is to be rapidly lethal it continues to fall. If the patient's powers of resistance are retained and reaction occurs, the tension again rises. In most of the patients observed, presumably in the socalled third stage of cerebral compression, according to Kocher's classification, there was little if any elevation in blood pressure but coincidently there were other signs of manifest compression. Therefore, in the series studied, the absence of an increase in arterial tension did not indicate that undoubted compression did not exist. Our routine, however, was to record the blood pressure every half hour for the first ten or twelve hours immediately after the patient was admitted to the hospital.

A number of the patients studied had respirations which were very shallow and infrequent. As the other signs of compression became manifest, the breathing became deeper and slower and in one or two instances the typical Cheyne-Stokes respiration occurred. Here again is a sign from which no definite information is gained.

The ophthalmoscopic findings may be of the greatest help in the determination of the amount of intracranial tension and in furnishing an indication for operative relief. In the early hours after an injury to the brain it is very uncommon to find marked evidences of pressure in the optic discs, but afterwards, however, as the intracranial tension rises, the evidences of an early papilledema become more pronounced. The hyperemia of the nerve heads together with the fullness and tortuosity of the retinal veins and perhaps an edema of the nasal halves of the discs furnish valuable information upon which a definite plan of treatment may be instituted. The examination of the eye grounds should be but one part of the careful and detailed neurological examination which should be made in all cases of acute brain injury. One might venture to state that perhaps in no other one acute condition is it so necessary that such patients be watched constantly and frequently repeated neurological examinations, together with the measurement of the spinal fluid pressure, may reveal the secret of the whole problem.

Lumbar puncture is most valuable, both for the purpose of diagnosis and as a therapeutic measure. Too much emphasis cannot be placed upon the care with which this operation should be done. It is obvious that an intracranial hemorrhage which has already been arrested may be made to start up again after withdrawal of the cerebrospinal fluid with the consequent lowering of pressure. The danger of herniation of the medulla down into the foramen magnum must always be thought of though this accident has been reported to be quite uncommon in acute traumatic conditions. At any rate the plunger should never be completely withdrawn until the flow of fluid is slow and gradual. Withdrawal of fluid at intervals for the relief of cerebral edema following injury has been proved to be of undoubted value. The systematic records of the brain tension as determined by measurement of the pressure by the mercury manometer at lumbar puncture supply data of great precision and may furnish the only tangible evidence of an increase in intracranial pressure. The manometer used in the series studied was that devised by Landon of Philadelphia. With this instrument the normal readings varied between six and twelve mm. of mercury, the average being about nine mm. Any reading above twelve mm. of mercury, with the patient lying prone, was considered to indicate an increase in the pressure.

The presence of blood in the spinal fluid, excluding that which is due to the trauma of the puncture, indicates only one thing, namely, bleeding into the subarachnoid spaces or into the cerebral ventricles or both. Therefore, cerebral injury in itself does not speak either for or against operation.

Other signs indicative of intracranial trauma are bleeding from the mouth, nose, and ears. Excluding extracranial injuries, bleeding from the mouth nearly always means bleeding from the posterior part of the nasal cavity and indicates usually fracture through the cribriform plate of the ethmoid bone. Bleeding from the ear often means that a fracture of the petrous portion of the temporal bone has occurred and there is frequently an injury to the seventh and eighth cranial nerves on this side. Such signs serve only to affect the prognosis in so far as the development of meningitis is concerned.

In addition to the foregoing points, most of which are common to all cases of intracranial injury, a careful and painstaking neurological examination should be made in every case, but owing to the fact that the majority of patients with cerebral injury are brought to us unconscious, the examination is necessarily objective. When surgical shock is present, all examinations should be postponed until reaction has become established.

TREATMENT.

The routine treatment of the cases observed was somewhat as follows: The patients were put to bed in a quiet, darkened room. The head of the bed was elevated slightly and an ice cap was applied. Free evacuation of the bowels was induced early and for this calomel in divided doses was usually given. When possible the patients were given small amounts of liquid nourishment. Codeine was found to be better than morphine for restlessness. All possible precautions were taken to prevent the patients from falling out of bed and to avoid this accident we used two broad pieces of canvas which were stretched from the head to the foot of the bed on either side and fastened in place above and below and to the sides of the bed by means of ropes which were passed through rings in the canvas and tied. This fashioned a sort of hammock barrier on either side of the bed. Urotropin in doses of fifteen grains every four hours for six or eight doses, was given in selected cases, the course being repeated every few days. Though the value of this drug as a meningeal antiseptic has been contested, its chief indication, if it has one, is in cases of compound fracture where the danger of a complicating meningitis is feared, as in fractures passing through the ethmoid or in one communicating with the external ear. A radiograph of the head should be made in all cases, preferably a stereoscopic examination, but the patient should always be handled very carefully in order not to subject the head to any unnecessary jarring. Patients with head injury are, as a rule, very irritable and in a semiconscious state and a large proportion of the cases are in surgical shock. therefore the utmost patience and care should be exercised in making the examination. While an x ray examination should always be made, its chief diagnostic value is confined to depressed fractures, therefore properly instituted treatment of the patient should not be postponed until x ray evidences are available. Aside from cases which show depression the röntgenogram can give no pertinent information that is not already at hand.

As yet the profession is not prepared to attempt an absolute standardization of the surgical indications in acute head injuries, excepting in gunshot wounds and in compound, depressed fractures. Patients showing moderate compression, which fails to subside after repeated lumbar punctures and methods of depletion, with the resulting lessening of cerebral edema, require subtemporal decompression with drainage. In all cases of manifest severe compression and compression which is increasing, a decompression should be performed without delay. This operation, when properly performed, relieves the acute compression from either hemorrhage or edema. Each case is a law unto itself and requires most careful observation and study before the question of operation is finally decided upon. Some surgeons have said that perhaps persistent unconsciousness is, in most cases, the best index for surgical intervention, but no one sign alone should ever determine our course of treatment. To sum up the indications for operation; all patients with a history of an injury to the head, should be carefully studied for evidences of an increase in intracranial pressure. A correlation of all the observations described in the preceding paragraphs should comprise our standard. The measurement of spinal fluid pressure at lumbar puncture offers the most accurate and scientific index of the brain tension.

There is one common condition often associated with acute head injuries which is an absolute contraindication for operative intervention and that is surgical shock. This state is in no way different from that observed in patients seen immediately after other severe injuries. It should be promptly recognized and combatted accordingly, for until this condition is successfully under control, it is of no importance what additional complications there may be. All examinations which would in any way disturb the patient should be postponed until the patient recovers from shock. There will be time enough then to make the necessary examinations and decide upon the appropriate treatment. A symptom complex closely simulating surgical shock may be present in certain cases after a period of thirty-six to forty-eight hours. This is now recognized to be indicative of a very severe cerebral traumatism, rather than of shock *per se*. It represents the final stage of compression where there is edema of the medulla with a paralysis of the vasomotor centres. These patients should never be operated upon, for the mortality is always a hundred per cent.

The use of a hypertonic solution of sodium chloride (thirty per cent. concentration), given intravenously at the rate of one c. c. a minute, may either alone or in combination with lumbar puncture tide the patient over a mild compression. The use of this solution has also proved of great value in certain cases that have been decompressed and as a preliminary measure prior to operation. Its action, as explained by Weed and McKibben in their Army laboratory reports, is that of an agent which produces a prompt depletion of the cerebral edema. The hypertonic salt solution probably reverses the action of the choroid plexus, converting it into an absorbing organ, with the resultant draining off of the cerebrospinal fluid. This injection should not be given oftener than every thirty-six hours.

The treatment of acute cerebral injuries must be conducted not only for the purpose of relieving the immediate symptoms and saving the patient's life but the question of the possible prevention of serious after effects must be borne in mind. It is well known that a great many cases of skull fracture with intracranial trauma make a complete recovery without operation in so far as the acute manifestations are concerned, but our responsibility is to reduce to a minimum the possibility of permanent brain damage and therefore to lessen the incidence of late symptoms. It is in the early stages of the injury that properly directed treatment will give the best permanent results and we may expect the number and severity of late complications to diminish only as a result of thorough early treatment. Patients with a history of an old injury to the brain very often present no localizing sign of the lesion but it does not follow that in the absence of any tangible evidences of the location of the injury that such individuals have not suffered permanent brain damage. It has been proved beyond doubt, by both animal experimentation and necropsies upon human beings, that after even comparatively slight contusions to the brain, the effect may be manifested by widespread punctate hemorrhages. It is obvious, therefore, that permanent lesions may result from the compression following the edema and the longer this compression is allowed to be present the greater become the possibilities of the establishment of a chronic pathology.

A real difficulty in the interpretation of symptoms in patients with an old head injury is probably due to their having acquired a neurosis, but it is not fair to consider such cases as primary neurotics because of the inability to demonstrate the pathology. It is true that in patients of this class there are more likely to develop neurotic tendencies and many have undoubtedly acquired a greater sensitiveness to the influence of imaginary complaints which are often very disturbing factors in the determination of compensative disabilities. Therefore a real organic cerebral condition, whether serious or not in itself, may serve as a convenient peg on which to hang a vast number of functional symptoms. To treat these patients and thus emphasize and even exaggerate their disabilities may prevent or at least retard a recovery. This phase of the subject is of extreme economic and national importance because the number of compensated cases both among the war disabled and in industrial life is rapidly increasing. Such patients are often influenced by their friends as well as by other patients that their injuries have produced permanent effects and that they will never be entirely well again, so that the problem increases in intricacy. The superadded functional disability is only another instance of a socalled way out of a host of complicating difficulties and the result is that the patient finds refuge in a neurosis.

The persistent impairment of mentality, together with other symptoms referable to the central nervous system, like headache, changes in disposition and habits, vertigo, epilepsy, lessening of physical endurance, paralyses, and signs of chronic increased intracranial pressure, are some of the late effects which we are called upon to prevent. We should approach the problem both from the mechanical and the mental viewpoint.

Further Pathological Studies in Dementia Præcox, Especially in Relation to the Interstitial Cells of Leydig

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PART I: HISTOLOGICAL APPEARANCES OF THE INTERSTITIAL CELLS IN THE DIFFERENT FORMS OF INSANITY.

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(*Concluded from page 253.*)

The second stage I have divided into early and late: Nos. 8 and 11, early stage. In these there were many tubules showing active spermatogenesis, but many in which there was very obvious regressive atrophy of the spermatogenic cells and thickening of basement membrane. There were pronounced changes of the Leydig cells in both (Fig. 9 B). In the second stage there is more pronounced spermatogenic regressive atrophy of tubules, thickened basement membrane, Nos. 1, 4, 5, 7, 12, 14, 18, 23, 27, but still some tubules show spermatozoa. No eosin clumps of Leydig cells are seen with low power (Fig. 9D).

The third stage.—No spermatogenesis, tubules atrophied, often containing only Sertoli cells, with lipoid granules, thickened basement membrane. No normal Leydig cells—generally increase of fibroblasts (Fig. 7 E and F).

There is a general correspondence in the amount of regressive atrophy of the interstitial cells and the spermatogenic epithelium. In the normal, and in certain forms of mental disease, especially general paralysis, epilepsy, senile dementia, organic dementia, Korsakoff psychosis and some cases of manic depressive insanity without dementia, the interstitial cells can be seen as eosin stained clumps with a low power (Fig. 9 A and C). This occurred in only two cases, in which the patients had only been eighteen months in the asylum (Fig. 6 B). As I have mentioned that in prolonged and extensive suppuration occurring in hospital cases the eosin substance disappears, it might be said that the absence of clumps of eosin stained cells visible with a low power was due to the intercurrent disease, especially pulmonary tuberculosis, which accounted for death in seven of the twenty-seven cases. But four of the number died of acute lobar pneumonia after a few days' illness and some from acute or subacute dysentery, and the normal Leydig cells were not visible in all but two of these, presumably early cases (4 and 6, Table I). Moreover, in general paralysis and other psychoses or brain disease, the intercurrent disease did not cause a disappearance of the eosin stained clumps of cells. It may, therefore, be presumed that in dementia præcox there is a regressive atrophy and failure of function of the interstitial cells coincident with, and in great measure proportional to, the regressive atrophy of the spermatic eqithelium. With this regressive atrophy is a diminution and in a few cases an almost total disappearance of the interstitial lipoid.

The pathological changes thus appear to affect the functions of the interstitial cells and the spermatic epithelial cells. In some few cases, especially in the cases of psychoses, death occurring in the postadolescent stages of life, the two tissues are not equally affected. In the manic depressive type several cases showed fairly normal spermatogenesis and a marked diminution of normal interstitial cells. Again, in a case of chronic Korsakoff psychosis with cirrhosis of liver and carcinomatosis, the spermatic tubules showed no spermatogenesis but fairly normal interstitial cells. A glance at Mr. Kenneth Walker's cases of men dying late in life, shows that sometimes the degree of regressive atrophy of the two tissues do not appear to coincide (Table II). Of course, allowance must be made for the fact that this is not conclusive evidence, for one part of the testis may show active spermatogenesis, another not; and again, one part may show normal interstitial cells, another not.

PART II: THE MORBID HISTOLOGY OF THE TESTES IN DEMENTIA PRÆCOX.

By MIGUEL PRADOS Y SUCH, M. D.,

Sir Frederick Mott has placed at my disposal the testes of a number of his cases, and I have examined sections which I have prepared by the Del Rio-Hortega silver method, which is especially useful for demonstrating the spermatozoa and nuclear changes. I have also examined a number of his sections of testes stained by hematoxylin eosin with a view of showing the changes in the interstitial cells in dementia præcox and other diseases when compared with the normal. My findings agree with the description which he has given in Part I. But before proceeding to describe the results obtained by my investigations I will describe the Del Rio-Hortega method, which I generally used. Of the various modifications of this method the following was the one generally used by me, as the tissues had been hardened in formol:

NUCLEAR STAINING.

Sections cut by the freezing method are taken from distilled water, placed into the silver solution (see below), and warmed at a temperature of 50° to 55° C. until slightly yellow in color. They were then placed direct into a two per cent. solution of formol (neutralized by calcium carbonate) until the section becomes black. Washed in distilled water for about one minute and then placed into gold chloride solution (1 in 500) until the section becomes grey, usually about half a minute. Then into a five per cent. solution of hyposulphite of soda for five minutes: in this it becomes a rose color. Wash in water, fix section to slide, blot off excess of water, and dehydrate with a creosote-carbolic-xylol mixture (creosote, 10 c. c.; carbolic acid, 10 gm.; xylol, 60 c. c.), and mount in Canada balsam.

Silver solution.—Five c. c. of a ten per cent. solution of silver No. 3, precipitated by twenty c. c. of a five per cent. solution of carbonate of sodium; dissolve precipitate by few drops of ammonia, and add water to fifty-five c. c.

SPERMATOGENESIS.

I have examined sections of a series of testes from the following cases and Figs. 7, 8, and 9 with the descriptions summarize the histological changes I have observed.

SUMMARY OF THE LITERATURE OF THE INTERSTITIAL CELL.

The Interstitial Cell.

The interstitial cell consists of a more or less eccentrically placed mass of condensed granular cytoplasm containing a nucleus; the peripheril portion of the cell may, however, be extensively vacuolated. Von Lenhossek has in consequence applied the terms endoplasm and ectoplasm. This typical structure is not found in all the cells but all gradations may be observed from cells whose bodies are composed entirely of endoplasm to those in which it is reduced to a remnant in the immediate vicinity of the nucleus. Plato regards these vacuolated forms as old cells, the opposite extreme being youthful forms; however, their presence is restricted to a very few animals, if, indeed, it is not limited to man. They were found by Ganfini only in man. Whitehead, in a long series of mammals, also found them only in man. Nothing is known about their chemical composition and their inconstancy gives them little importance. But it has been pointed out in Part I that there is a correspondence of vacuolation and lipoid in the cells.

Specific granules.—Regand describes certain secretory vesicles in the rats' testicles fixed in Teleyesniczky's fluid (equal parts of three per cent. solution potassium bichromate and five per cent. acetic acid). With many methyl blue eosins they stain red; they are brought up well by iron hematoxylin, although the best is the Reinke's neutral gentian as modified by Dersley. In such preparations the majority of the interstitial cells contain definite granules, one or two microns in diameter, often in clusters. They lie for the most part in the peripheral portion of the cells but may be found anywhere in the cytoplasm. Each granule is contained in a distinct vacuole (thin sections). In the case of cells which contain many fat globules they and their granules must lie in the same vacuoles.

The staining reactions of these granules and their resistance to acetic acid call to mind the zymogen granules of the pancreas. On the other hand, the reaction for prozymogen, which usually can be obtained in cells which produce zymogen, could not be obtained. But, without any reference to their chemical nature, we may regard the granules as an internal secretion of the interstitial cells.

The interstitial cells appear long before the epithelium of the tubules have become active.

Addison Thornton states that vital staining with trypan blue reveals two types of cells in the internal structure of the testis. One is elongated in the form of fibroblast, while the other is rounded or polyhedral in shape. Both types, according to the definition of Evans, are to be considered as macrophages and are not, as Goldmann interpreted them to be, identical with the interstitial cells of Leydig which represent the testicular organ of internal secretion. The vital staining with counterstain make it possible to differentiate between the interstitial cells and the macrophages.

Pigment.—"This is not present in any of my material (man, cat, opossum, pig, rabbit, dog, sheep, bull, grey squirrel, and rat) and accordingly is not a constant content of the interstitial cells." Sehrt, who has made the latest study of its nature, finds that it is fatty, staining well with Sudan III in frozen sections and faintly even in material that has been treated with alcohol. He considers it to be a waste of pigment.

Crystalloids.—The discovery by Reinke in 1896 of crystalloids in the interstitial cells of an executed criminal aroused considerable interest at first and his findings were confirmed by Lenhossek and others. It soon became evident, however, that their presence is restricted to a very few animals, if, indeed, it is not limited to man! they were found by Ganfini and by myself only in man. I shall content myself with simply noting their inconstancy.

Function.—Plato held that it was the function of the interstitial cells to act as nurse cells, passing their fat and pigment through minute canals in the walls of the tubules to be received by the Sertoli cells and there used as pabulum in the formation of spermatozoa. His theory was supported in some measure by Friedman and von Lenhossek but no one has been able to confirm his statements as to the existence of canals in the walls of the tubules and the passage of fat through them. Indeed, the presence of fat in the lymphatics of the testicle would indicate that the flow of fat is away from the tubules, while Ganfini thinks that this appearance is a secretory phenomenon unconnected with the production of fat. The analogy with what has been observed in various gland cells is certainly very suggestive of secretory function, but probably the activity of the cells is not limited to the formation of fat. It should be stated that the vacuoles are not always so smooth and regularly circular; frequently they are large, irregularly shaped cavities with more or less ragged margins, doubtless the result of the breaking down of the partitions between adjacent vacuoles. It is hardly necessary to add that the demonstration of the structure of the interstitial cells require fresh tissue and good fixation. Moreover, the study of the development of the interstitial cells in different animals has shown us that frequently fat is present in the tubular epithelium before it appears in the interstitial cells and that in the pigmented cells it is never present in any but the minutest amount. Finally, as Ganfini has pointed out, in undescended testes, where the Leydig cells are usually typically developed and numerous, the tubular epithelium is undeveloped or atrophied and subsequently no spermatozoa are formed.

Ganfini believes that the fat itself is the internal secretion of the cells and is poured into the general circulation through the lymphatics. He bases his opinion upon the fact that fat is found in the lymphatics leaving the testis and that the fat in the cells is in the form of more or less discrete droplets rather than in large drops as in the ordinary adipose cells and consequently is no ordinary fat.

SUMMARY OF INVESTIGATION OF VITAMINES AND THEIR RELATION TO INTERSTITIAL CELLS.

Ezra Allen: Degeneration in the Albino Rat Testis Due to a Diet Deficient in the Water Soluble Vitamine, with a Comparison of Similar Degeneration in Rats Differently Treated, and a Consideration of the Sertoli Cells, *Anatomical Record,* 1919, xvi, p. 93.

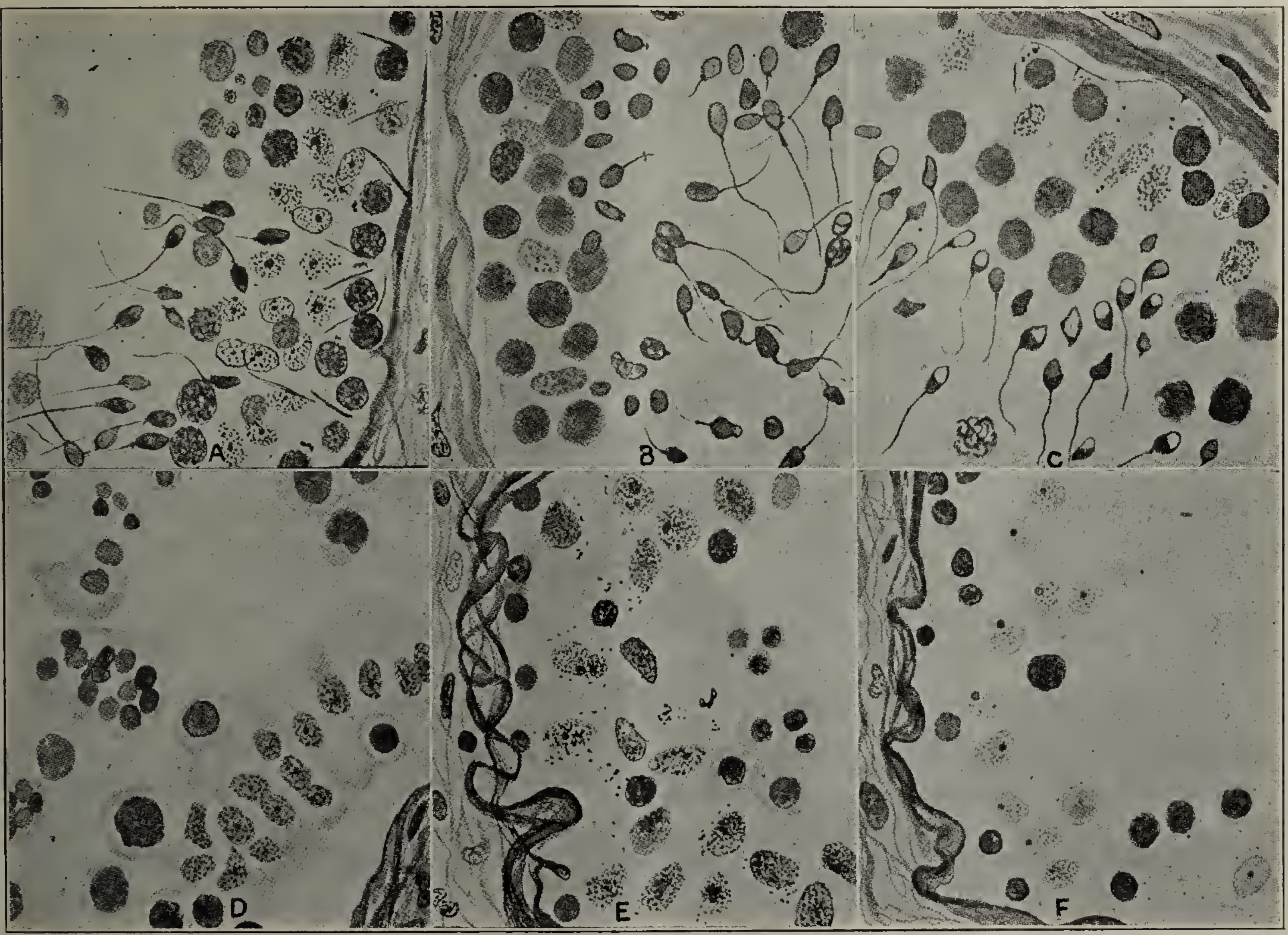

Fig. 7.—A. Photomicrograph of normal testes in which death resulted from shock caused by severe injuries. It will be observed that the heads of the spermatozoa are uniformly stained and uniform in size and the spermatocytes all show nuclear skeins; there is no thickening of the basement membrane.

B. Section of testis of No. 6, Table I. Part I. Section of the tubule in which the earliest changes can be observed. In many of the tubules these changes would not be found. Compared with the normal many of the beads of the spermatozoa are imperfectly stained, they are not of uniform shape and size; the tails are imperfectly formed and fewer spermatocytes show the nuclear skein; the basement membrane shows some thickening. This change in the spermatozoa was observed also by the hematoxylin-eosin method of standing (Fig. 4).

C. Section of testis of No. 8, Table I. Section of a tubule in which early changes can be observed in the spermatozoa similar to the previous one but rather more marked. It will be observed that the testes in both these cases were of fair weight and the duration of time in asylum was under two years and showed first stage of regressive atrophy.

D. Section of testis of No. 5, Table I, second stage of regressive atrophy. Some few tubules showed spermatogenesis but the great majority showed absence of spermatogenesis; formation of spermatids were found in some tubules, in others no heterotypical mitosis.

E. Section of testis of No. 15, Table I, third stage of regressive atrophy; no spermatozoa; no evidence of heterotypical mitosis, great thickening of basement membrane and overgrowth of fibroblasts.

F. Section of testes of No. 12, Table I, third stage of regressive atrophy. Great deficiency of nuclear stainable substance, absence of heterotypical mitosis, great increase of interstitial tissue and thickening of basement membrane.

It will be observed by reference to the table that in these cases the weights of the testes correspond fairly well to the three stages of regressive atrophy of the organs. The results in the main confirm the findings obtainable by Sir Frederick Mott by the methods he employed.

1. Reduction in the quantity of water soluble vitamine in the diet of rats results in total degeneration of all the germ cells, but does not interfere with growth and development in other respects; the Sertoli cells persist.

2. In the male this atrophy of germ cells is accompanied by hypertrophy of the interstitial tissue.

3. The type of degeneration in the male germ cells is rather to that produced by x ray treatment of the testis directly.

4. A similar degeneration of the germ cells has been observed in a group of rats, part of which were subjected to prolonged alcoholization. The degeneration was found to a less extent in all but one of their five brothers not alcoholized. In this group hypertrophy of the interstitial tissue was not observed.

5. Examination of this degenerated tissue and more careful study of normal, wellfixed tissue, confirms Régand's conclusions that the Sertoli cells form a syncytium.

6. The nucleolus of the Sertoli cells under these degenerated conditions appears to be an equally bipartite instead of, as normally, an unequally bipartite body.

7. The interstitial tissue is much increased in

quantity in the rats put upon a reduced watersoluble vitamine.

McCarrison:

"One of the most remarkable results of foods deficient in vitamines is the constant and very pronounced atrophy of the testicles. It occurs in extreme degree, whether the dietary is exclusively composed of autoclaved rice or whether butter and onions are added; in the latter circumstances the atrophy is slightly less extreme. It appears then to be one of the most specific of the effects of avitaminosis in pigeons. . . . Histological examination shows a complete cessation of the function of spermatogenesis. The capsule of the organ and the intertubular trabeculæ are greatly thickened; the diameter of the tubules is lessened; spermatozoa, spermatids, and spermatocytes are wholly absent. The tubules are lined by a single but often incomplete layer of cells which still preserve, in a considerable proportion of their numbers, nuclei which from their appearance and staining reactions, seem capable of regeneration." *Studies in Deficiency Disease,* 1921, p. 139.

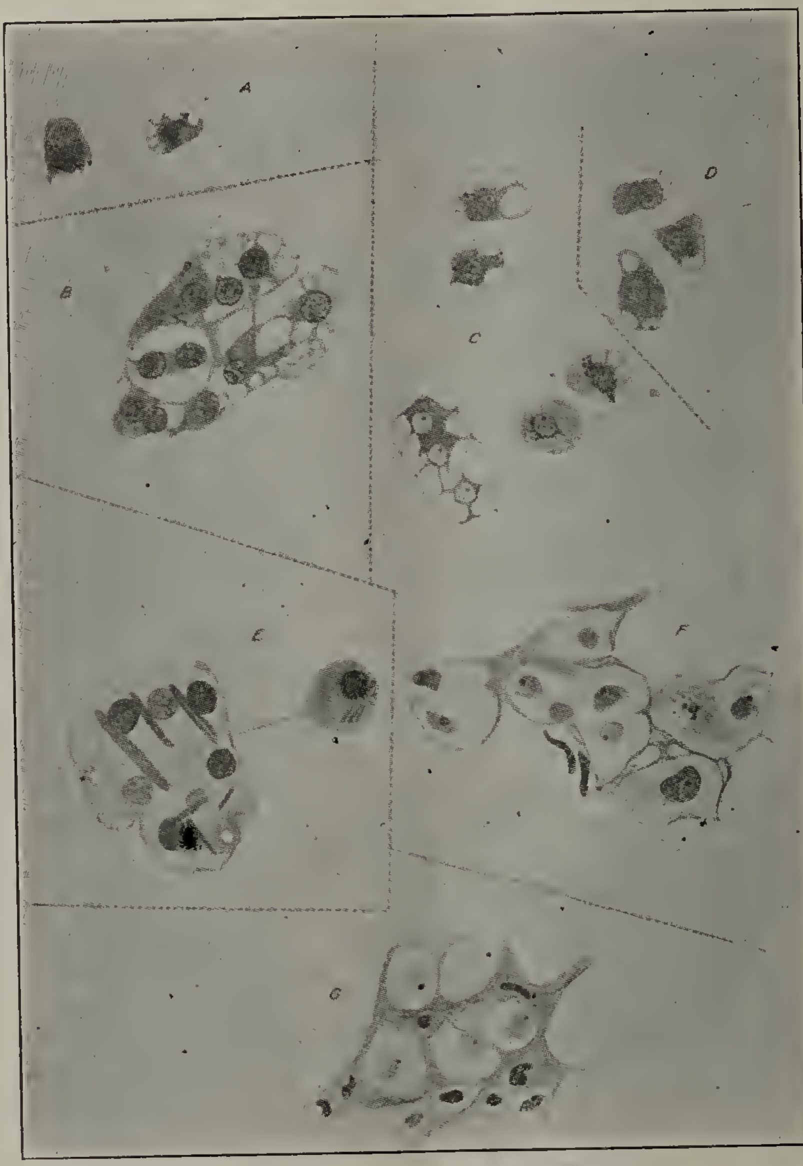

Fig. 8.—Interstitial cells stained by Del Rio-Hortega method. Two pigmented cells: A, showing a mass of pigment occupying the greater part of the vacuolated cells. The nucleus is very pale and contains very little chromatin (Case 7, Table I).

A group of vacuolated interstitial cells, B, showing nearly normal staining nuclei, some pigment granules (Case 14, Table I).

Three sets of vacuolated cells, one forming a syncytium by the vacuolation: C, nuclei round but paler than normal; the other pairs of cells show pigment granules in the cytoplasm (Case 9, Table I).

Three cells from a surgical case, D, showing vacuoles at the periphery of the cell, no pigmentation although obtained from a man in the prime of life.

Examination of the interstitial tissue by the Del Rio-Hortega method. The normal case showed the following appearances. Single polyhedral cells with cytoplasm fairly deeply stained containing a round nucleus with deep chromatin staining and three crystals in the cell. A less well stained synctium with six nuclei, each having a fairly well stained chromatin network. Within the synctium of cells are seven varied sized crystals (E). These were not seen in the pathological condition of the testis.

Section of testis No. 5, Table I, shows a synctium of cells with fibrous tissue between and two nuclei fibroblasts. The nuclei are pale and, excepting the nucleolus which is not observable in the normal interstitial cells, hardly take the stain. The cytoplasm is faintly stained in parts of the cells (F).

Section of testis of No. 15, Table I, shows a number of cells separated by fibrous tissue and fibroblasts. The nuclei are very pale excepting the nucleolus: the cytoplasm is unstained (G).

Magnification oil immersion lens and No. 4 ocular.

Houlbert:

Vitamine and growth. — "*Experiments in chickens* showed that when they were deprived of vitamines in their food the birds showed an arrest of growth and of the development of the secondary sexual characters (spurs, comb, and tail feathers), and progressive anemia. One bird killed on the fourteenth day, and on postmortem examination was found to be in a state of extreme inanition. All organs appeared normal except the testes, which were very small, and on histological examination showed an arrest of the cellular divisions and metamorphoses which normally occurs in the seminal tubules. The interstitial cells of the testes showed a very pronounced infiltration of pigment, which as Bouin and Ancel have shown, occurs in the interstitial cells of glands whose endocrine glands are in decline. Sections of the suprarenals show an arrest of development of the chromatin cells." *Paris médical,* December, 1913.

SUMMARY BY SIR F. W. MOTT AND DR. PRADOS Y SUCH.

The general conclusions arrived at from the investigations contained in Part I and Part II are as follows:

1. The interstitial cells prior to birth act as sexual determinants, and at birth form the greater part of the interstitial tissue which constitutes the major part of the testes (Fig. 1). They contain lipoid granules. Moreover, fine lipoid granules are seen between the embryonic epithelial cells of the tubules.

2. The interstitial cells after birth undergo a regressive atrophy and disappear; inasmuch as the seminiferous tubules at four months are twice the size of those at birth and are approximated; it follows that the fine lipoid granules which are found between the epithelial cells, have, in all probability, served as a pabulum for their formative activity. But since there is still lipoid in the residual interstitial cells (Fig. 2), this correlation of function of the interstitial cells and the epithelial formative activity has not ceased, and it is reasonable to assume that had the child been six months old at death, it would have ceased and no lipoid would have been found anywhere and the following facts support this conclusion. At ten years the tubuli seminiferi are for the most part approximated and as a rule are only a little larger than those at four months; there is no lipoid in the interstitial tissue, or in the tubules. There are occasionally to be seen mitotic figures as if spermatocytes were commencing to be formed, but no Sertoli cells are observable. In the interstitial tissue are seen numbers of oval, round, and polymorphic nuclei, not nuclei of fibro-

blasts, and occasionally a definite small polygonal cell, eosin stained, can be seen, indicating that *pari passu* with the tubular epithelial formative activity there is a reappearance of the interstitial cells.

3. The appearances of these immature interstitial cells resemble in many respects the appearances presented by the interstitial cells in advanced cases of dementia præcox (Fig. 6 C).

4. At puberty and adolescence the tubules have increased in size owing to active proliferation and spermatogenesis. Abundance of mature interstitial cells are present (Fig. 6 A), which are undergoing active functional change; they contain lipoid. and lie upon a lymphatic space which surrounds the tubule. Reasons are given why it may be assumed that this lipoid substance passes through the basement membrane to the Sertoli cells which contain fine lipoid granules and serve as nurse cells to the spermatozoa.

5. Microscopic appearances indicate the continuous development of new interstitial cells which mature, actively function and decay. They are present in extreme old age (Fig. 9 A) and sometimes when spermatogenesis has ceased.

6. The microscopic examination of the testes of twenty-seven cases of dementia præcox, all commencing in prepubertal, pubertal, or adolescent stages, are described together with the age of admission and duration of asylum treatment, and age at death with cause of death and principal mental diagnostic conditions are given in Table I.

7. It may be noted that a number of patients died of pulmonary tuberculosis, but a number died of acute disease, e. g., pneumonia and dysentery and after a few days or a week or two of illness. The microscopic conditions did not differ essentially from those dying of pulmonary tuberculosis. In some there was no history of masturbation, whereas in others there was definite information, but the microscopic examination did not reveal any difference.

8. The regressive atrophy found microscopically corresponded, generally speaking but not always, with the loss of weight of the testes and the naked eye appearances. As a rule the longer the duration

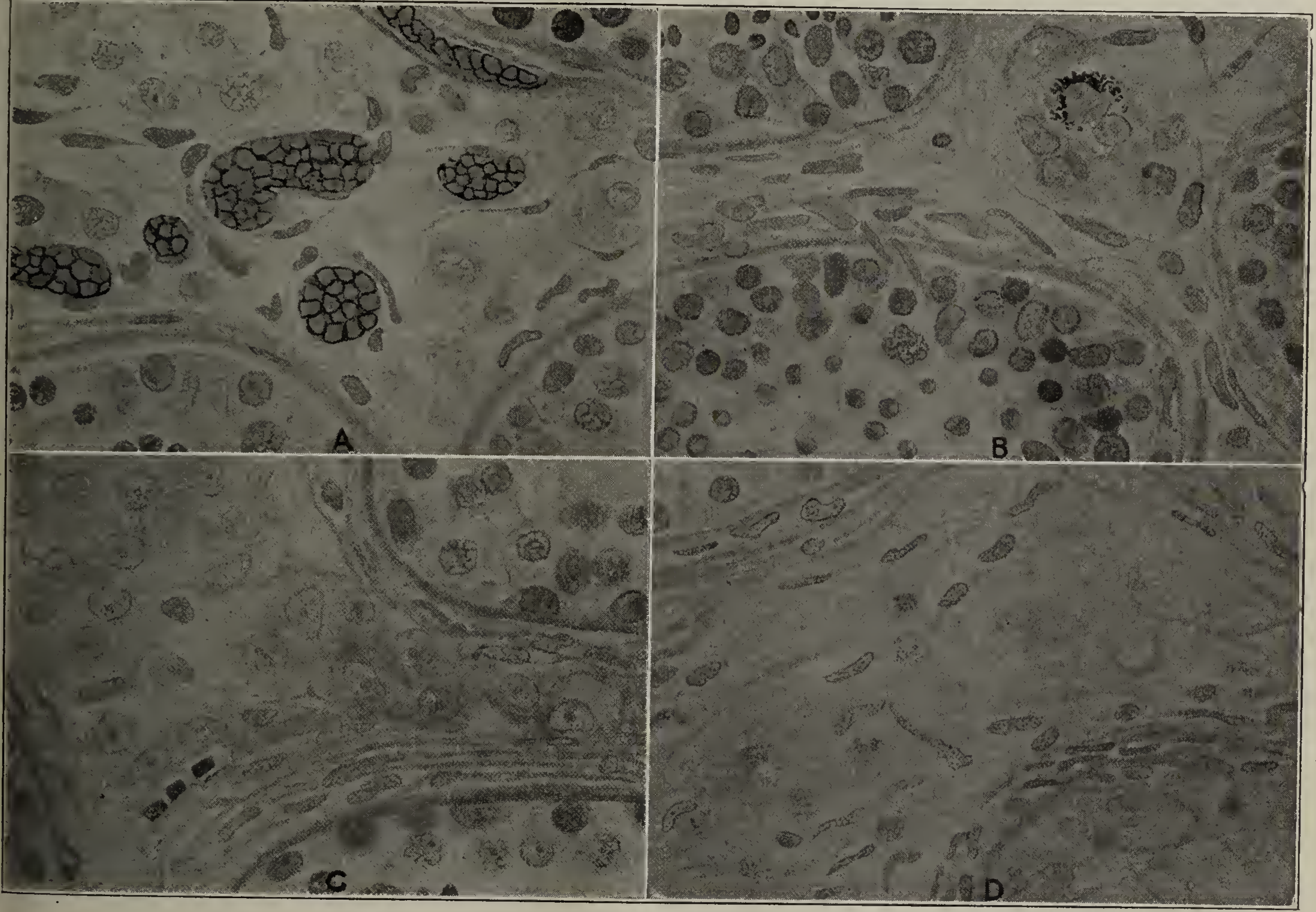

Fig. 9.—Examination of hematoxylin-eosin preparations. A. Section of testes of a man, aged eighty-one, suffering with senile dementia referred to in Part I. On the left a portion of tubule is shown exhibiting spermatogenesis with normal stained heads of spermatozoa, the basement membrane of this tubule and the adjacent one, which shows normal staining spermatogenesis and spermatocytes, is thickened by an increase of fibroblasts. Above is an isolated small interstitial cell and above this a group forming a syncytium by vacuolation, the nuclei of normal shape and staining; one cell contains pigment granules.

B. Section of testis or normal case dying of shock described in Part I showing abundance of normal interstitial cells lying between the tubules. They are most of them mature and contain a good amount of eosin staining substance although the vacuolation would show that for the most part they contained lipoid. There are three young cells lying together showing no vacuolation.

C. Section of testis of a case of juvenile tabo-paralysis. Spermatozoa were found in the vesiculæ living eight hours after death. Most of the tubules showed normal active spermatogenesis. There was some thickening of basement membrane of tubules; this is seen in the tubule on the right by the increase of fibroblast nuclei. There are abundant normal interstitial cells which are visible as eosin stained clumps with a low power. The nuclei are well stained and there are no fibroblast nuclei intervening. This should be compared with D.

D. Section of testis from Case 19, Table I. Observe the great fibroblast nuclear proliferation of the basement membrane upon which lies only a syncytium of Sertoli. The interstitial tissue consists of a very vacuolated syncytium of cells with pale nuclei of irregular form and size. The elongated more deeply stained nuclei are the nuclei of intervening fibroblasts.

of the mental symptoms the more pronounced was the atrophy, but duration of asylum treatment does not strictly connote the length of duration of symptoms.

9. The regressive atrophy, as determined by microscopic examination, has led me (F. W. M.) to divide the cases into three groups. *The first stage,* in which the changes indicate the formation of normal and degenerate spermatozoa (Fig. 4 and Fig. 7 B and C) and commencing failure in the formation of normal interstitial cells and by special staining an increase of interstitial fibroblasts. In *the second stage* there is, in addition, an obvious shrinkage of many of the tubules, increase of fibroblasts, thickening of basement membrane, and failure of spermatogenesis. The mature interstitial cells are fewer in number and there are numbers of immature cells with pale nuclei deficient in chromatin (Fig. 6 C, Fig. 8 F and G, and Fig. 9 D). In *the third stage* the tubules either show no spermatogenesis, or only a few tubules relatively show some spermatozoa, some being degenerate; there is a failure of formative nuclear activity and many or (in advanced cases) all the tubules consist only of a very thickened basement membrane lined by Sertoli cells. These cells usually contain lipoid granules in the syncytium, and when this occurs there is lipoid in the interstitial tissue and cells. This indicates that the essential feature of the atrophy is a primary germinal defect.

10. In seven of the cases of dementia præcox a pigmentary deposit was found in the interstitial cells (Fig. 6 D) which is not seen in normal conditions except in old age, and therefore may be regarded as evidence of presenile change.

11. Table III[1] gives a summary of results obtained in nine cases of psychoses other than dementia præcox, death occurring in postadolescence. It will be observed that similar appearances of regressive atrophy of the testes occur in many of these as are found in dementia præcox. Three cases of manic depressive insanity without symptoms of dementia showed normal active spermatogenesis, but apparently a diminution of normal interstitial cells, although death occurred in two of them from pulmonary tubreculosis. In a case of alcoholic dementia, aged sixty-five, the interstitial cells were fairly normal although there was absence of spermatogenesis; the cause of death may account for this.

12. There are four cases in Table IV[1] in which symptoms of dementia præcox came on in postadolescence and all of these showed marked degressive atrophic changes of the tubules and the interstitial cells similar to those observed in cases commencing in early life (Fig. 6 D).

A recurrent manic depressive insanity may terminate in dementia, e. g., No. 6, Table III, and then regressive atrophic changes are found exactly similar to those met with in dementia præcox. Otherwise manic depressive insanity does not show these regressive atrophic changes in the testes. It will be interesting to see whether there are changes in the brain corresponding to those I have described in dementia præcox in these cases.

13. As a contrast to these regressive atrophic changes occurring in the biogenetic psychoses are the changes in the testes of cases of general paralysis—an acquired disease. Whereas in the former the atrophy is primary and affects more or less the whole organ, in the latter it is secondary to inflammatory changes in the epididymis, either gonorrheal or syphilitic, and causing a complete disappearance of the epithelium of the tubules by obstruction of the *vasa efferentia.* The result is local patches of dense fibrous tissue affecting especially one testis, sometimes both. In the immediate neighborhood are tubules showing normal active spermatogenesis and Leydig's cells. Not infrequently amidst the atrophied tubules consisting only of thickened basement membrane are seen nodules and groups of fairly normal interstitial cells.

In spite of this secondary atrophy which affects the testes of so many paralytics, the average weight of the pair after removal of the tunica vaginalis and epididymis is eight gm. heavier than the testes of cases of dementia præcox. Whereas in the great majority of cases of dementia præcox an emulsion of the testes showed no spermatozoa, the converse was found in general paralysis.

14. Previous studies show that the changes in the reproductive organs is a part of a generalized germinal defect of durability and vital energy of the whole body most manifest in the brain, especially the cortex, and the reproductive organs.

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[1] Tables III and IV were omitted on account of lack of space, but will appear in the author's reprints.

The Cerebellar Manifestations of Epidemic Encephalitis*

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Seldom has the reappearance of an almost forgotten disease created such a profound interest as that brought about by the advent of epidemic encephalitis in the wake of the great influenza epidemic. At first the medical mind was engrossed in cataloguing the protean symptoms of this grotesque malady through which patients slept their way into death. But a recent tendency of the disease to produce motor phenomena has focused their attention on its pathology and etiology and has aroused interest in the localization in the cerebrospinal axis of the lesions producing such disturbances. Therefore it was thought that a brief report at this time of eight cases of epidemic encephalitis with cerebellar manifestations might be of value.

According to Oppenheim (14) and Tilney and Riley (15), the basic cerebellar function is synergia and all cerebellar symptoms hinge upon its impairment. Cerebellar localization for the different phases of synergic activity is much more difficult and indefinite than cerebral localization because the cerebrum initiates the act while the cerebellum controls the machinery for its accomplishment. The complexity of the accomplishment is apparent when it is realized that the factors of time, force, and the three dimensions are involved. The vermis has been shown to be the seat of synergic control of the axial and trunk musculature, i. e., the movements of the eyes, neck, jaws, face, tongue, larynx, pharynx, and the complex act of walking, the cerebellar hemispheres being held responsible for the synergic control of the extremities (Courtney) (2). Since many symptoms associated with definite cerebellar lesions cannot be placed in the accepted category of cerebellar function, the blanket term cerebellar syndrome has been used to cover all symptom complexes referable to injury of the cerebellum, its connecting pathways and associated nuclei. The clinical separation of the cerebellum from its correlated centers is rapidly being accomplished as is evidenced in late years by the differentiation of the various types of vertigo, nystagmus, etc. It must be emphasized that the basis of the socalled cerebellar syndrome is asynergia, which, split into its components, gives the concrete symptoms: vertigo, incoordination, ataxia, nystagmus, speech disturbance and tremor. In the following report of eight cases with cerebellar manifestations from a series of fifty cases of epidemic encephalitis it is to be noted that in only three cases was the diagnosis of a dominant cerebellar disease justifiable.

CASE HISTORIES.

Case I.—Mrs. M. C., forty-two years old, began in September, 1920, to have sudden attacks of vomiting, which bore no relation to the taking of food, which were less frequent in the recumbent position, and which had led her to undergo varied medical and surgical treatment consisting of a curettage, appendicectomy, and oophorectomy. In November, 1920, we saw the patient for the first time, when she complained of vomiting, drowsiness, dull headache, dizziness and double vision.

Examination showed a well nourished young woman of postadolescent hypopituitary type. Nystagmus to the left was marked, the pupillary reactions were normal, and there was slight congestion of the retinal vessels and haziness of the outlines of both discs. The examination of the chest and abdomen was negative. The tendon reflexes were exaggerated. There was a marked ataxia, particularly of the hands and the patient walked in a circle toward the left. This was accompanied by a tendency to fall to the left. The vomiting, dizziness, nystagmus, incoordination, ataxia, and other symptoms, increased gradually; the patient became stuporous and died February 9, 1921.

The blood count in September showed 9,600 white blood cells. In January the blood count showed 35,000 white blood cells. The blood Wassermann was negative; the urine was normal; two lumbar punctures done on successive days, three days before the death of the patient, gave a cell count of four, globulin plus four, gold chloride curve 0—4—5—5—5—4—5—5—4—3;the second gold chloride curve was 0—1—1—2—3—4—5—3—1—0.

A postmortem performed an hour after death showed no pathology except in the brain and spinal cord. There was a moderate increase of fluid beneath the leptomeninges; the cerebral convolutions were swollen, and the sulci shallow. The vessels of the pia were engorged with blood, particularly over the hemispheres. There was marked distention of the fourth and lateral ventricles, with clear fluid, particularly of the anterior horn. The small vessels of the brain substance were decidedly prominent. There were no gross changes in the basal ganglia. The section of the cerebellum showed definite pathology in the left hemisphere. The left dentate nucleus was greyish pink in color and bulged above the cut surface. Although its markings had disappeared its consistency was unchanged. It was sharply demarcated from the rest of the hemisphere which seemed normal. Many crosssections of the brain stem and medulla showed no pathological change. There were no evidences of syphilis or tuberculosis. The distinctly cerebellar character of the symptoms in this case were fully in accord with the findings at autopsy.

Case II.—Mr. N., aged thirty-six, was seen July 22, 1921, with Dr. Anderson of Kennard, Nebraska. The patient had complained for two days of vomiting and vertigo with a sensation of falling. This vertigo was not rotatory in character and seemed to be in no one particular direction. It was severe enough to keep him from driving a car. A complete physical examination was negative, except for a nystagmus upwards and to the right and bilateral Babinski's signs.

The pulse was 56. The temperature was 98.6° F.; white blood cells, 11,500. The spinal fluid came under slightly increased pressure. It was clear, contained globulin plus two, four lymphocytes per cubic millimetre and the gold chloride curve was 1—1—2—2—1—0—0—0—0.

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*From the medical department of Creighton University.

Recovery following the puncture was rapid and complete. The infection was transient in character but abortive cases must be observed for at least a year, as recrudescences are common.

CASE III.—W. Z. (Fig. 1), aged fifteen years; admitted to St. Joseph's Hospital May 16, 1921, complained of twitching of the arms and shoulders. One and a half years ago he had been taken suddenly ill with an acute infection accompanied by severe headache, vomiting, dyspnea, palpitation, vertigo, and incontinence of feces and urine. These symptoms had persisted for three months with stupor, gradually deepening into coma. With subsidence of the febrile symptoms, appeared the twitchings of the shoulders, arms and hands with increasing weakness in the right leg and arm so that he dragged the right foot in walking.

Physical examination showed an undernourished boy with a peculiar flexion of the head. There was a constant shrugging of the shoulders (ninety a minute), and flexing of the elbows and wrists. Rhythmic movements of the thumb and great toe were present. An attempt to move either arm accentuated the tremor and twitchings. The facial, cervical and thoracic musculatures were constantly disturbed by myokymic waves. The eye muscles twitched continuously, especially at night when all the other muscles were quiet. The third, right lower seventh and right twelfth nerves were paralyzed. There was paresis of the right anterior tibial group of muscles. The abdominal reflexes were absent, the cremasterics present. The right knee jerk was plus four, the left, plus two. There were no other reflex abnormalities except the absence of the left ankle jerk. Sensory changes, muscle atrophy and mental defects were absent. An oblique nystagmus upward and to the left appeared late. The increase in the incoordination of the extremities was apparent as the boy had become unable to button his clothes and he walked with the slouching, shuffling, rolling gait of a drunken sailor. A röntgenogram of the skull revealed only large sphenoidal cells.

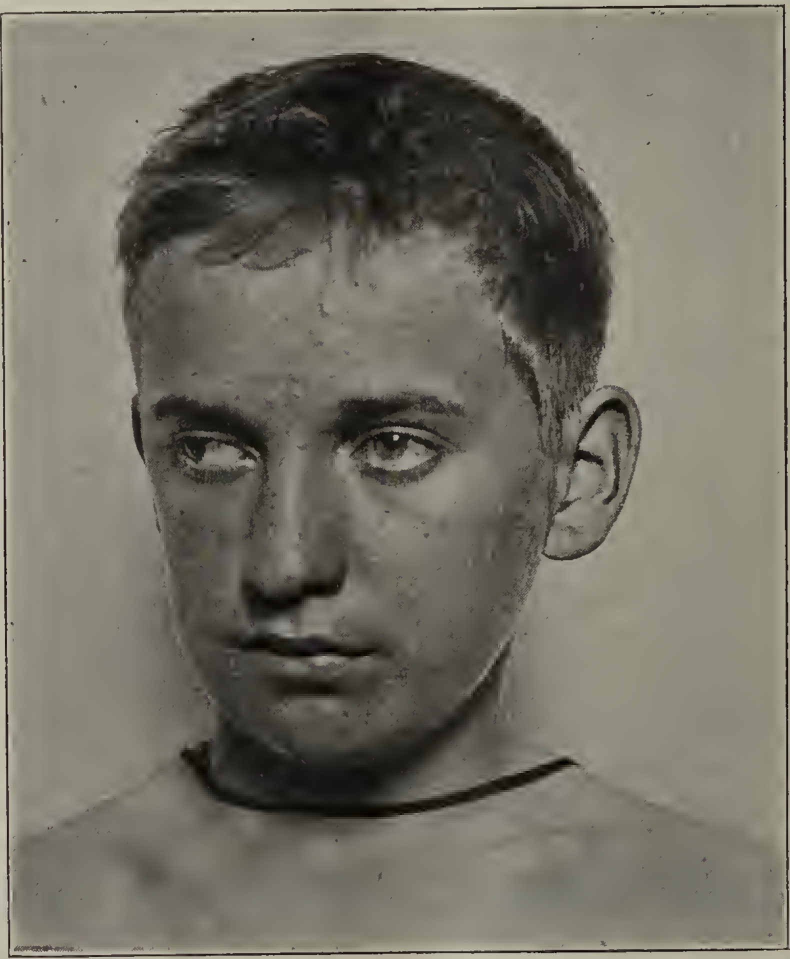

FIG. 1.—Case III. The flexed attitude of the head, deviation of the right eye and a smooth right side of the face are still apparent two years after the onset. This patient was found dead in bed on December 16, 1921. He had been to school the day before and an examination five days previously showed no change in the patient's condition.

The blood count showed 11,500 leucocytes with sixty-five per cent. polynuclears. The blood Wassermann was negative. The pulse was 100, the respirations 40, temperature 99° F., during the stay in the hospital from May to June, 1921. The urine was acid with a trace of albumin. The spinal fluid examination in June, 1921, showed globulin plus one, no cells and a negative Wassermann. The gold chloride curve was 3—3—3—3—1—0—0—0—0. This case belongs to the severe type of mesencephalic metencephalic, and myelencephalic encephalitis.

CASE IV.—Mr. F. W., aged fifty-three years, married, was referred to us by Dr. Rowe of San Francisco. Following an attack of influenza, seven months before, the patient grew unaccountably weak and nervous. He had slept almost continuously for several months, only awakening for meals. The lethargic period was followed by an insomnia which persisted for months, the patient sleeping from six a. m. to three p. m., then lying awake at night. At the onset the urine contained albumin and casts sufficient to warrant a diagnosis of acute nephritis. Four months before we saw him, he began to complain of itching and burning in the nose.

Examination seven months after the onset showed a very well nourished, middle aged man. The face was red, the nose was glossy and periodically the patient would rub his nose, blow it violently, and insert the finger into the nares. The tempo of the tic was increased by excitement and effort. The eyes were normal except for horizontal nystagmus to the left. Hearing in the right ear was diminished and there was a paresis of the left lower facial nerve, but the patient could pucker the lips, whistle and smile normally.

Sensation was normal. A bilateral patellar clonus was marked. The knee jerks were plus two, Oppenheim's reflex was present and bilateral Gordons were obtained. The Babinski sign was present at times. There was no ataxia or incoordination at this time. The spinal fluid obtained was clear but came under increased pressure. The globulin was plus two, cells two to the cubic millimetre; the Wassermann was negative. The gold chloride curve was 1—1—1—2—2—3—3—1—0—0.

The patient was admitted to the hospital two months later (February, 1921) and had a stormy time for several months with the insomnia and nasal tic. The spinal fluid returned to normal with a flat gold chloride curve. But as these symptoms subsided he suddenly began to show symptoms of a recrudescence and extension. Apathy was marked, and there was some fever. Our attention was directed to the cerebellum by the slurred, mumbling speech, the tremor of the hands with ataxia and incoordination of the extremities and a marked horizontal and vertical nystagmus. The gait was unsteady. These symptoms lasted about six weeks. Lumbar puncture aggravated these symptoms, whereas in the earlier months, lumbar puncture alone sufficed to relieve the insomnia. An excess of globulin reappeared in the spinal fluid. The gold chloride curve was 1—1—1—2—2—2—2—1—0—0.

The lighting up of the infection with recurrence of abnormal spinal fluid findings and extension to the cerebellum is noteworthy.

Case V.—Mrs. P. P., aged thirty-nine years, came under observation in September, 1920, complaining of drooping of the eye lids, double vision and a peculiar smell which came on after a chill two weeks previously.

Physical examination revealed a well nourished woman with ptosis of both lids. The pupils were normal, but the left internal rectus muscle was paralyzed. Upward rotation was incomplete, and there was nystagmus downwards and to the left. There was a paresis of the right facial nerve. The tongue protruded in the median line with marked fibrillation. The knee and ankle jerks were plus three. The Babinski and Oppenheim signs were present and abdominal reflexes absent on the left side. As there was little improvement in the patient's general condition she was discharged from the hospital at the end of two months during which time infected teeth and tonsils were removed. Two lumbar punctures during this period gave a clear fluid without increased pressure, with no increase in globulin, and gold chloride curves respectively, 1—1—1—1—1—0—0—0 and 1—1—3—5—5—5—3—1—0. Two months later the disturbance in the deep reflexes was the same but the cranial nerve paralyses had almost disappeared. The patient complained of difficulty in articulation and a stiffness around the mouth. The spinal fluid taken at this time was normal except for the gold chloride curve, 1—1—1—2—3—2—2—1—0—0. The leucocyte count was 7,800, with forty-four per cent. polynuclears. Six months later, in June, 1921, she reported at the office because of a socalled backset. Weakness and tremor of the right arm were the chief complaints.

Examination showed residual weakness of the right internal rectus muscle with marked horizontal nystagmus to the right. Fibrillary twitching and tremor of the facial muscles were conspicuous in the oral region. There was a fibrillating tremor of the tongue. Synergic contractions of the right arm and hand were marked when the patient moved any of her extremities. There was a pillrolling tremor of the right hand, and a coarse tremor of the right leg, although ataxia was slight. Vertigo was present only when the patient arose quickly. The knee jerks were plus four, and the ankle jerks were absent. The other reflexes were normal. The late appearance of the tremor and myoclonia at a time when the patient seemed to have recovered from the acute infection leads to speculation on the ultimate sclerosing effects of the perivascular infiltration of the earlier stages of the disease.

Case VI.—A. K., aged twenty years, single, farmer, was seen on June 4, 1921, complaining of double vision and attacks of dizziness. Three weeks before he had been seized with an attack of nausea and vomiting, accompanied by fever and headache.

Examination showed a well developed young man with paralysis of the left lower seventh, twelfth, and fifth cranial nerves and with some weakness of the right internal rectus. The pupils were in middilatation and reacted sluggishly to light. There was almost complete obliteration of the optic discs with numerous fresh hemorrhages. The retinal vessels were congested and fragmented. The chest and abdomen were normal. The abdominal reflexes were absent, the cremasterics present, and Babinski, Oppenheim, and Gordon signs were present on both sides. An ankle clonus was plus two on the right side, plus one on the left, patellar clonus was absent. The knee jerks were normal on the left side and absent on the right. There was a marked bilateral Kernig and rigidity of the neck. The patient was difficult to control and irresponsible. Twitchings and tremors of the various parts of the body appeared in rapid succession. He lost control of his sphincters. Although his temperature was normal on admission, with the onset of the twitchings it rose 100° and 101°, accompanied by a corresponding rise in pulse and respiration. The twitchings were of at least three different kinds: first, fibrillary, particularly in the bellies of the large muscles; second, myoclonic, affecting the individual muscles, such as the flexors of the thumb and toe; third, there were synergic twitchings of the shoulder girdle, particularly on the right side and choreic movements of both arms and legs. The patient occasionally had a slight convulsive contraction which involved the entire left side. Late in the disease the patient's extremities wandered aimlessly over the bed.

Lumbar puncture showed increased pressure, globulin plus two and two cells per cubic millimetre. The Wassermann test was negative. The gold chloride curve was 5—5—5—5—4—4—1—1—0—0. The leucocyte count was 13,500, with seventy-two per cent. polynuclears; blood Wassermann was negative.

The patient's condition became gradually worse, with increased difficulty in swallowing and articulation. The twitching became fibrillary in character, the eyes deviated to the right, with spontaneous horizontal nystagmus to the right.

An autopsy was performed within thirty minutes after death. There was a great increase of fluid within the dura, the vessels and sinuses were markedly congested, the cerebral hemispheres edematous. There were no changes in the vessels at the base. The optic tracts appeared normal. The brain is in preparation for serial study.

The disease was of the fulminating type and widely disseminated as indicated by the multiplicity of motor symptoms and by the signs of meningitic irritation.

SYMPTOMS.

Vertigo stands out preeminently in the symptomatology of our eight cases. When one considers how numerous the possible causative lesions of vertigo are, and how many of these lesions may be present in epidemic encephalitis, the chief seat of whose pathology is the mesencephalon and associated structures, it is remarkable that this symptom has not been noted in all cases. Diplopia alone should ac-

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Cases VII and VIII will appear in the author's reprints.

count for the presence of vertigo; many cases have eighth nerve changes such as would give rise to a vertigo from vestibular involvement. The vertigo was not rotatory in character. This is explained quite naturally by the diffuse character of the lesions in this disease as contrasted with the sharply demarcated lesions of tumor or abscess (Stewart) (11). Of the two patients who complained of falling to one side, one (Case I) tended to fall to the side of the cerebellar lesion found at autopsy.

Nystagmus was present in all the cases at some stage of the disease. It was usually of the horizontal type, rhythmic and in one direction. In one, the nystagmus was horizontal in both directions; in another, pendular and oblique and in the others it was either a simple vertical or horizontal. Spontaneous nystagmus was present in the terminal stages of one case (Case VIII). As with vertigo, it was impossible to localize the lesion by the direction of the nystagmus with the exception of a case with nystagmus to the left, whose chief lesion was found in the left dentate nucleus. The diffuseness of the cerebellar lesions explains the rarity of localization symptoms. Except for ocular paralyses, eye muscle coordination was normal. There was nystagmus to the right in one case with paralysis of the left sixth nerve. The frequency of nystagmus in epidemic encephalitis seemed in direct ratio to cerebellar involvement which is in accordance with the view of Oppenheim (14), Horsley, and Bruce who consider this symptom of cerebellar origin.

Ataxia was present in all eight cases. In most instances, as the lethargy and the febrile manifestations waned, the ataxia appeared. Occasionally it seemed to be a function of the flexibilitas cerea. It resembled but little the ataxia due to posterior column changes. It occurred whether the eyes were open or closed, and Romberg's symptom was rarely present. The faster the movements of the extremity, the greater the incoordination. The greater the evidence of lateral cerebellar lobe involvement, the greater was the incoordination. The to and fro swaying of the body, the unsteady placing of the feet and the tendency to walk in circles toward the supposed side of the lesion were typical of cerebellar disease. The incoordination in the right arm was so marked in one patient (Case III) that he learned to shuffle and deal cards with his left hand, and although only fifteen years old, his skill at cards became the talk of the hospital ward. Patients suffering from incoordination showed no loss of muscular power, no disturbance of epicritic or protopathic sensation, and no loss of muscle, bone, or joint sensation. There were no sphincter disturbances. Even with the greater displays of cerebellar symptoms, cerebral function commonly remained normal. Ataxia occurs as the result of disturbances in the frontal lobe or in any of the frontocerebellar connections, but cerebral ataxia is increased by intention and effort to correct it is wanting.

Tremor is closely associated with incoordination especially of the intentional variety (Stewart) (11), (Tilney and Riley) (15), and (Oppenheim) (14). Cerebellar tremor can be differentiated from that of lenticular origin only by the associated symptom-complexes. Six of our eight patients had tremor. In two cases it appeared early and persisted throughout the disease. In two cases tremor with nystagmus, vertigo, and ataxia appeared months after the onset of ophthalmoplegic symptoms. The tremor was coarse and usually affected the upper extremities. One patient (Case V) had a tremor of the right leg and arm which was present on attempted movement of the parts and increased in rapidity and excursion under excitement. She was able to walk quite normally but when seated any effort brought on violent tremors of the right leg and foot. In one instance (Case III) the tremor was increased by any mental effort. Oppenheim's (14) observation on a case of cerebellar atrophy with intention tremor supports the hypothesis of the cerebellar origin of tremor.

Dysarthria was a rare symptom. Although many of the above mentioned symptoms have been assigned to the paralysis agitans syndrome because of the existence of blurred and monotonous speech, its frequent association with cerebellar manifestations in epidemic encephalitis speaks for cerebellar origin of this symptom. Stewart (11) happily terms it articulative ataxia. The defective intonation, the jerky articulation, the mumbling and mouthing of words, the dysphagias and laryngeal crises observed in our cases, have seemed without exception to be due to asynergia or incoordination rather than to muscular paralyses. We have seen days of dysarthria alternate with days of approximately normal speech. In one case the asynergy of the laryngopharyngeal group came on immediately after a lumbar puncture to disappear in a few days.

Tics were very rare according to the literature. Two cases in our series of fifty had tic. One patient who had no cerebellar manifestations during the lethargic period came in several months later with bloodshot eyes, intractable insomnia, and a pronounced tic. He would keep hawking and violently clearing his throat for hours at a time, and at frequent intervals he would dig his thumb into the suprasternal notch precipitating thereby the most terrifying fits of coughing. In the other patient (Case VI) tic preceded other cerebellar manifestations by several months. Except when asleep or diverted he would blow, rub, and pick his nose in fixed rhythm for hours at a stretch. With the onset of nystagmus, ataxia, and vertigo, his tic increased much in intensity. After several months this tic disappeared along with the other cerebellar symptoms.

Headache was complained of in all of our fifty cases and was not peculiar to the cerebellar type of the disease. It was located as a rule in the occipital region, but it might be referred to any part of the head or scalp; in many instances as in Case VII, the headache seemed due to trigeminal involvement. The headache was often intractable but responded quite occasionally for short intervals to lumbar puncture.

Optic nerve changes occurred in only three of our fifty cases and these were of the cerebellar type. We found only two references to fundus changes in 115 cases of the lethargic type (16). Hoppy and Mason (9) in a series of eighty-one cases reported one with a double optic neuritis in a child with ataxia, tremor, incoordination, weakness, and muscle atrophy. In two of our cases (Cases I and VI) choked disc was marked and was accompanied by old and recent retinal hemorrhages. Vision in three of our cases was badly disturbed and in one the argument for decompression was met only by the experience gained in an analogous case where decompression had been futile. At autopsy the optic tracts in two cases showed no changes; the swelling may be assumed to be due to the contiguity of the infected mesencephalon and cerebellum (11). Fundic changes (10) would seem to indicate a grave prognosis as our three patients died.

Vomiting was always present in the more severe cases of the cerebellar type. In Case I vomiting was the only symptom for months and much therapeutic effort had been directed against this symptom before vertigo, nystagmus, and incoordination appeared. Vomiting often disappeared as the other manifestations came on. There was nothing to distinguish it from that common in intracranial disturbance. It was benefited by lumbar puncture.

Myoclonic, choreiform, and athetoid movements (Tilney and Howe) (12) have been commonly reported during the past year. Whether they are manifestations of cerebellar lesion is hard to determine (Lhermitte)(5). The recent investigations of the form and functions of the cerebellum by Tilney and Riley, Mills and Weisenberg and the earlier works of Babinski and Dana have fixed the synergic control of the trunk and extremities in the cerebellum. They assume these myoclonic movements to be due to disturbances which cause synergistic groups of muscles to perform useless or awkward motions. Much time and effort have been necessary to transfer volitional acts such as piano playing or typewriting from voluntary cortical to automatic cerebellar control. No matter how automatic these acts have become, the cerebral cortex may at any time volitionally break the current and assume control through the frontocerebellar tracts. The virus of epidemic encephalitis in order to effect such symptoms as myoclonus, chorea, and athetosis, must affect the cerebellum or its connecting tracts. That this occurs is shown, first, by the presence of other cerebellar symptoms and by the absence of such cerebral signs of psychoses, hemiplegia, loss of memory, and other symptoms; second, by the rhythmicity of the movements, and by the inability of the patient to control these rhythmic movements except by substitution of definite volitional acts, and finally the constant occurrence of nystagmus in these myoclonic cases emphasizes a striking similarity to the nystagmus myoclonus syndrome of Lenoble and Aubineau (11). In one of our series, the myoclonic movements in the leg disappeared while walking. Balla and Rijnberg (1) have localized choreiform movements together with tic in the cerebellum. Klein (1) reports a case with choreiform movements that had a cyst in the dentate nucleus. Pollon (8) and Sherrington localize athetosis, chorea, and tic in the cerebellum or red nucleus.

A chronological study of the muscular symptoms both in the individual and in the race in the various epidemics is of interest. In the French epidemic (Netter) (13) the lethargic type was replaced by the myoclonic within three months (January to March, 1920). It has been noted by Rosenow (7) that by passing the organism through a series of animals the character of the symptoms changed towards the myoclonic. Muscular disturbances are noted in all recent communications (Boyd) (3) and (Hamill) (4) on the sequelæ of epidemic encephalitis. Does the organism, smouldering for months in the mesencephalon, adapt itself to life conditions in the neighboring cerebellum of the individual, and, while smouldering along in an epidemic acquire an adaptation, in a similar fashion, for the cerebellum of the race? Déjérine attributes the choreoathetoid movements of the extremities to a lesion of the superior cerebellar peduncles and Oppenheim (14) adds the vermis. The myoclonic symptoms in epidemic encephalitis are varied in type, in location and in their relationship to other symptoms. Fibrillary twitchings are most common. Riley (6) considers them of spinal origin. They may involve any muscle group. The finest type is the socalled rabbit twitching of the lips. Synergic movements are well illustrated by shrugging of the shoulders and rhythmical swaying of the arm or leg; one of our patients (Case III) while awake, maintained a rhythmic movement at the rate of ninety a minute for over a year. Athetoid motions, and choreiform movements, were rare.

It is my duty and pleasure to acknowledge my obligations to my associates, Dr. A. D. Dunn and Dr. Warren Thompson, for the use of their cases and for reading and criticizing the entire manuscript.

CONCLUSIONS.

1. Certain cases of epidemic encephalitis give definite clinical and pathological evidence of cerebellar involvement.

2. Myoclonus is so frequently associated with known cerebellar symptoms that it would seem reasonable to attribute it to cerebellar disease.

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A Case of Epidemic Encephalitis with Papilledema Simulating Brain Tumor

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The case referred to in this paper is reported for its peculiar symptomatology, and to give an idea of the great difficulty which one occasionally meets in dealing with encephalitis in the earlier stages. Cases of epidemic encephalitis presenting choked disc and cerebral hemiplegia have only recently been reported. When we consider the enormous amount of clinical material dealing with epidemic encephalitis, hitherto published, it seems quite significant that earlier observers failed to report any cases of similar type.

Foster Kennedy (1) in a recent report of five cases of acute benign meningoencephalitis with papilledema explains the rushing onset of the optic neuritis, which synchronizes with the amelioration of symptoms, as due to a sudden block of intraventricular drainage by meningitic exudate. This interpretation seems quite logical. The cases reported by Kennedy do not differ from mine in the main points, but the absence of fever, the slow course, the projectile vomiting, the cranial tenderness, and the occurrence of clonic contractions indicative of cortical irritation, were the misleading signs of the diagnosis in this case.

Case.—O. G., aged twenty-three, male, married. Family history: father suffered from diabetes, one brother from multiple sclerosis, one paternal uncle and one maternal uncle died of cerebral hemorrhage; mother was well, six other brothers and one sister were all well. From the personal history it appears that the patient suffered from severe epistaxis seven years ago, and from influenza four years ago, while serving in the United States Army. He contracted malaria in Italy at the age of six. He was married over a year, wife had no pregnancy.

The present illness began early in August, 1921, with acute indigestion apparently from eating fish. The next day headache appeared for the first time and recurred several times a day for the period of an hour. This condition lasted about a month and was associated with gastrointestinal disturbances. On one occasion vomiting occurred, but it was attributed to morphine given to him by his family physician. He was taken to St. Luke's Hospital, where he remained for two weeks, after which he left against the doctor's advice. During the time he was in the hospital he vomited several times, but the headache was somewhat relieved. The neurological examination, including the spinal fluid, was negative. The fundi were normal. The diagnosis was that of gastroenteritis with acidosis. After returning to his home the patient's symptoms, which had been temporarily relieved, grew worse, especially the headache, for the most part frontal, and vomiting. Gradually dizziness and general exhaustion appeared, together with a certain degree of mental dullness, which confined him entirely to bed. On one occasion during a medical examination, and about a week after he had left St. Luke's Hospital, the left eye and the left angle of the face twitched for about forty seconds. No attention was paid to this, as it was considered to be due to the traction exerted on his head by his physician while examining the movements of his neck. No paralysis had been observed up to that moment.

I was called to see the patient the next day and found that gross muscular power of the right arm and leg were somewhat diminished. The patient was unable to keep the wrist and fingers extended for as long a time as the other side. Approximation of thumb and fingers of the left hand, and all the movements of the left limb such as pronation, supination and rotation were executed with some difficulty. On test for active movements of the lower extremities there was evidence of asthenia in the left one. There was a left facial weakness which did not reach the degree of paresis: The weakness was more pronounced in the upper facial, the left eye at times remaining imperfectly closed. It was not possible to demonstrate a diminution of the tonus of the left palpebra when the patient's efforts were alert.

Deep reflexes of the left side were not brisker than those on the right; there was no clonus, no Babinski on either side. There was no definite Hoffmann. There were no sensory disturbances. The fundi indicated a blurring of the retinal vessels and of the contour of the disc, the veins were enlarged and tortuous. No rise in temperature was found, pulse 66°. The patient was advised to return to a hospital, a tentative diagnosis of brain tumor having been made.

During the next week, while the patient was awaiting admission to the hospital, the symptoms gradually became worse; vomiting, dizziness, headache increased in intensity. Definite localization of the headache on the right frontoparietal region appeared, and besides, this region seemed to be tender on percussion.

When I saw the patient with Dr. Zabriskie on the day after his admission to the Neurological Institute we found the general symptoms were still unchanged, except for the mental dullness which had almost reached the degree of stupor. It did not seem to us to have the character of lethargy. We found the patient's attitude somewhat listless and indifferent, expression rather dull, but responses were not retarded; attention somewhat poor, perception, memory and association not altered; speech and mimic unaffected. The tongue was badly coated. There was a slight elevation of the rectal temperature, which at night reached 100.5°, but the pulse was slow. The pupils responded to light and accommodation. Diplopia was not present, although there was a suggestion of double sixth nerve weakness. Otherwise all of the cranial nerves were intact. The deep reflexes of the left upper extremity were not exaggerated, but the ankle jerks were unequal. The superficial reflexes showed: abdominal, right lively, left absent; cremasteric, right active, left diminished; plantar, right flexion, left a tendency to extension. There was no clonus on either side. The muscular power of all joints was markedly diminished. On the whole the hemiparesis was more pronounced in the upper extremity than in the lower one; it was rather flaccid in type.

Eamination of the cutaneous sensibility could not be correctly done because of the stupor of the patient. Definite disturbance of the deep muscular sensibility and of the sense of position could be demonstrated to a moderate degree. There was a definite tenderness on percussion over the right frontoparietal region.

Radiograph of the skull taken on the following day failed to reveal any evidence of neoplasm. The spinal fluid showed: no cells, globulin negative, sugar positive, Wassermann negative, butyric negative. The blood count gave: hemoglobin 90, color index 0.9, red blood cells 5,040,000, white blood cells 11,000, neutrophiles 82, small lymphocytes 15, large mononuclears 3. Rectal temperature during the three consecutive weeks ranged between 99.6° and 100.5°. In two days it went as high as 101°. The elevation of temperature was usually accompanied by exacerbation of the headache. Evidence of pathological change in the fundi was demonstrated. Examination by Dr. Holden four days after admission showed: pupils sluggish to light and convergence, mobility normal, vision 20/20, fundi papilledema top discs + 5, retina + 2.

Four days later.—Symptoms continued to remain stationary. Somnolence was more pronounced. The patient would become somnolent on closing his eyes, responses would gradually fade out, become slower and slower so that they were extremely inaccurate. No thorough mental examination could be made.

Five days later.—Discs as before, pupils fairly active. The somnolence was somewhat diminished. The mental dullness was not such as to prevent a sensory examination. On the left side was found astereognosis tactile agnosia, apraxia, hypoesthesia both lower and upper extremity. The left lower extremity showed hypometria. There was still the same amount of muscular deficit on the left side, Babinski present on the left. Blood examination showed the white blood cells reduced to 8,000, neutrophiles reduced to 68, small lymphocytes 21, the rest remained as before.

Six days later.—There was great improvement in general symptoms; the muscular power of the affected side seemed to have gained somewhat. The patient complained less of the headache.

Nine days later.—A marked improvement in the general and local condition was manifest. Fundi showed top disc + 4, retina + 2. By this time the temperature had entirely subsided and the headache appeared only at greater intervals, usually at the time of digestion. The patient was able to stand without support; incoordination still existed in the left upper and lower extremities, there was a return of the left abdominal reflex, although still greatly diminished; mental symptoms had entirely cleared up.

A week later.—The top discs were 3.5. The patient had made such an improvement that it permitted his discharge from the hospital. At that time there remained only a difference in the tendon jerks—those of the left being livelier than those of the right. There existed yet a slight degree of astereognosis, and a residual asthenia in the left upper extremity. Except for a slight headache he felt almost well.

Incidentally it might be said that there never was any complaint of visual disturbances. The fundi gradually regained their normal appearance within the week that followed the discharge from the hospital. Dr. Holden, who examined the patient nine days after, found papilledema had practically disappeared, and there was no well marked elevation of disc. Examinations made two and five weeks later, respectively, revealed normal fundi, and normal vision.

In reviewing the whole history, we find that in favor of the tumor there were all the general symptoms of intracranial growth: Headache confined to the frontoparietal region, and cranial tenderness on percussion, vomiting (projectile), bradycardia, mental dullness, vertigo and choked disc.

Regarding the focal symptoms there was a gradual progressing hemiplegia, which began with a diminution of the tonus of the left upper palpebra, scarcely noticeable, followed shortly afterward by a slight reduction of power in the left upper extremity, which could be demonstrated on testing for active movements.

There was also bathyanesthesia, astereognosis, apraxia, ataxia (dysmetria right upper and lower extremity) on the same side.

Against the diagnosis of neoplasm was the rapid progress of the symptoms, the precipitate onset of papilledema and rise in temperature. This latter, however, was slight and, as it appeared late, could be explained as a mere concomitance of intestinal disorders, or as an indication of tuberculoma. The regression of the symptoms, both general and focal, sufficed to exclude a brain neoplasm. Somnolence also was against tumor but during the first period of the disease it did not surpass the degree of mental dullness, which is found in cases of tumor of the mesencephalon. Lama (2) has recently reported a case of tuberculoma of the subthalamic region, which *intra vitam* had presented a symptomatology similar to epidemic encephalitis.

Our case is instructive in so far as it shows that choked disc and other general and focal symptoms of intracranial growth may be found in cases of acute encephalitis, even in the absence of fever. Caution is especially necessary whenever there is a rapidly developing optic neuritis at the acme of the general and focal symptoms.

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Acute Multiple Sclerosis: An Unusual Case

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Dr. Foster Kennedy has remarked upon the fact that acute multiple sclerosis is becoming more common than formerly was the case. In 1921 the Neurological Service of Bellevue Hospital saw twenty-one cases of multiple sclerosis. Of these, five were of the acute type.

The following case presents a rather unusual picture.

Case I.—J. M., male, aged twenty-one; admitted September 28, 1921. The parents were born in northern Italy and are still living and in good health. One brother and one sister are in good health. Ten children died in early childhood and questioning revealed no evidence of there having been syphilitic symptoms in them. The mother had no miscarriages. Examination of the father and mother revealed no clinical evidences of syphilis. The patient is a laborer and had always been in good health. He denied venereal disease. His habits were temperate. Tobacco was used occasionally and until 1919 he drank beer and since then about two glasses of homemade wine a day.

In February, 1919, the patient fell about ten feet, striking his back and occiput. He was unconscious for a few minutes. Ensuing headache and backache kept him at home for two days. He then returned to work but felt so weak that after a few days he quit and entered the Neurological Institute. He stayed there two weeks without relief. Then he entered St. Vincent's Hospital, complaining of headache, vertigo, vomiting, staggering gait, and general weakness. After two weeks in this hospital diplopia appeared. In two months all his symptoms but the staggering gait cleared up. For a year he felt well. The gait difficulty gradually disappeared and the only symptoms were occasional paresthesia in the hands and feet, and a bit of urgency in urination. These symptoms occurred about once a month and lasted two or three days. In the summer of 1920 headache, vertigo, vomiting and staggering gait recurred. The attack this time cleared up in two or three weeks. In September, 1921, a dull, constant, occipital headache appeared. This was intensified by motion. There were additional disorders of objective vertigo, vomiting without nausea (usually after eating), numbness in the hands and ataxic gait. Within a few days the symptoms increased to such an extent that the patient had to enter the hospital. There were no bladder symptoms.

The patient was a well developed young man, weighing about 160 pounds and was five feet eight inches tall. His skin was clear, hair light brown, body hair normal in distribution. He seemed to be suffering acutely and was unable to turn about in bed because any movement produced vomiting, unaccompanied by nausea. The general physical examination revealed no abnormalities.

The pupils were equal and reacted normally. The right disc was blurred, the left pale in the temporal half. There was nystagmus in all planes and slight peripheral weakness of the left side of the face. The other cranial nerves, except the eighth, showed no abnormalities. Vestibular tests were impossible to judge because the patient could not stand having them performed properly.

The speech was of a cerebellar type. The gait was broad based and ataxic, with deviation to the right and a tendency to retropulsion. The Romberg sign was marked and brought out the retropulsion. Finger to nose and heel to knee tests demonstrated exaggerated intention tremor. There was adiadokokinesis on both the right and left of equal degree, and underlying the intention tremor could be discerned a tendency to past point.

On the left side of the entire body there was a moderate degree of diminution of pain and temperature sensibility. Touch and position sense were normal.

The tendon reflexes were definitely increased on the right and the abdominals were absent. Weak ankle clonus, Babinski, Oppenheim and Hoffman were found on the right. The left plantar reflex showed a tendency toward extension.

The pulse was from 90 to 100. Serology of the blood and spinal fluid was entirely negative. The blood count was normal.

The patient was in the hospital for five weeks. Treatment of silver salvarsan twice weekly, in doses of 0.2 gram, was given.

While under observation there were frequent, rapid and marked fluctuations in the clinical picture, and several new symptoms appeared. Salivation with a thick, tenacious sputum, nodding tremor of the head, diplopia on looking to the right, both urgency and difficulty in starting urination, and paresthesia of the left face and forehead were noted. On November 2nd, the patient was discharged, free of symptoms and showing none of the signs found at the time of his admission except slight increase in tendon reflexes on the right, diminished abdominal reflexes and sluggish plantar responses. The patient reported back to the ward for examination in December, 1921, and January, 1922. Except for occasional paresthesia in the hands there were no symptoms or signs.

SUMMARY OF THE CASE.

A young man, previously in good health, has within thirty months three episodes suggesting acute cerebellar and pontine lesions. In the intervals he is free of symptoms, except for paresthesia in the hands and a little bladder difficulty, and he works as a laborer.

The third episode lasts nearly two months. During the attack, nystagmus, diplopia, vertigo, impaired bladder control, speech difficulty, ataxic gait, bilateral pyramidal tract signs (more on the right) and a left sided diminution of pain and temperature sensibility were noted. These symptoms were the most prominent and persisted longest.

DISCUSSION.

The diagnosis in this case lies between tumor of the cerebellum or pons, thrombosis of the posterior inferior cerebellar artery (atypical, to be sure), angioneurotic edema of the pons and cerebellum, and multiple sclerosis.

The clinical course and multiplicity of symptoms rule out tumor of any region. Thrombosis of a luetic origin finds no supporting basis in this case. In any event, the gradual increase in severity and the variety of symptoms, in each of the three episodes, precludes thrombosis. Angioneurotic edema is excluded as a possibility for the same reasons. Solitary gumma, which would be a rarity even if syphilis was present, can be ruled out.

Multiple sclerosis, then, is the logical diagnosis. There may be difference of opinion as to whether this case should be called an acute one. However, in the volcanic onrush of symptoms and equally rapid recovery, we have a picture not at all conforming to the accepted ideas of multiple sclerosis. It is true that the literature cites occasional acute cases. But this case differs considerably from the textbook acute case. Possibly the experience of the Neurological Service of Bellevue Hospital has been too rich in unusual forms of multiple sclerosis. But in any event, attention should be called to the comparative frequency of these acute types of the disease.

I am indebted to Dr. Foster Kennedy for permission to publish this report.

141 West Seventy-fifth Street.

A Case of Dystonia Musculorum with Remarkable Familial History

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Case.—The patient, a white woman, twenty-nine years of age, was admitted into the Philadelphia General Hospital, June 3, 1921, her chief complaint in her own words, "My nerves are bad." The history of present illness was as follows: Trouble began at the time of birth of child which was stillborn. This was in 1915. She remained in the hospital at this time for two weeks. Since then she had been very "nervous." She had no spells of any kind, was not easily scared but just seemed to be unable to control herself. She admitted that she was a little "nervous" before the birth of the child. Past medical history was of no importance. She said she never sick until after the birth of the child. She was married at twenty-three. Had had only the one child. Her marital life had been very unhappy, her husband often subjecting her to violence, particularly when he was drunk. She worked in a shirtwaist factory before she married.

The physical examination was practically negative. The neurological findings were as follows:

1. Speech almost suggestive of that in pseudobulbar palsy.
2. Pupils slightly unequal.
3. Ocular excursion was limited upward.
4. Slight deviation of the tongue to the right, and patient seemed to be unable to hold her tongue out of the mouth. There was a coarse tremor of the tongue.
5. All reflexes markedly increased but equal.
6. The gait was incoordinate.
7. The station was uncertain with slight swaying motion.
8. Cried and laughed without provocation.
9. There was some mental deterioration. At present there were no delusions or hallucinations. Orientation was good as to person and place but poor as to time.

The most striking feature in the neurological examination was the gait. The following is a description of the gait by Dr. William G. Spiller: "Gait was very striking; incoordinate but not like that of cerebellar disease. The feet were far apart. Steps were short and the feet were scarcely lifted from the floor, but no dragging of the toes. The movements were distinctly incoordinate in the lower limbs, and were apparently chiefly so in the movements of the hip joints. In walking she had the upper limbs fully extended, each limb hanging outward a little aside from the body. She bent a little forward when walking; and when she rose from the chair she had a distinct uncertainty of station and had a little difficulty in getting her balance. There was no Romberg present. She had some nodding of the head forward and backward which was slight. The incoordinate gait was increased by closure of the eyes.

The following is a summary of the laboratory findings: Urine negative except for slight trace of albumen, blood urea 13 mg. to the 100 c. c., creatinin 1.10 mg. to the 100 c. c., blood sugar 115 to the 100 c. c., blood Wassermann negative in all antigens, spinal fluid negative in all antigens, cell count normal. The electrocardium was normal. The eye grounds showed a slight optic atrophy. The basal metabolism equalled plus 45. I should like to remark here that this basal metabolism was considerably high, especially in view of the fact that the basal metabolism on all our cases of Huntington's chorea was uniformly low.

We come now to a very striking and important feature of the case, namely the family history. The patient's mother was living and in good health except for blindness due to cataracts. The patient's father, T. S., died twenty-one years ago in the insane department of the hospital. An uncle died in a hospital for nervous diseases. An Aunt M. died in the Presbyterian Hospital, Philadelphia, with some "nervous" trouble. An Uncle J. died in the insane department of this hospital. This uncle had four children, cousins of the patient as follows: J., who died in the insane department; I., who was insane at death; W., at present a patient in the insane department of this hospital; G., also a patient in the insane department. The diagnosis of the uncle, J. S., of the father, T. S., of the cousins W. and G. S., was that of Huntington's chorea. Their insanity was that of the dementia of late chorea. There was also another patient, J. S., a brother of the patient, under discussion. I have mentioned this one last because of the diagnosis that was made on this patient, who is now dead.

Dystonia musculorum was the diagnosis. Dr. William G. Spiller was well acquainted with this patient and he himself made this diagnosis. The patient's brain and spinal cord are in Dr. Spiller's possession. Degeneration of the lenticular nuclei, particularly of the caudate nuclei and putamen was found. On looking up the history of this case I do not find a very satisfactory description of the symptomatology. There is a note by Dr. Charles Potts as follows: "The speech is indistinct, and cannot be understood, gait is slow and uncertain and at every two or three steps he flexes his body forward as if bowing, dementia is marked." One would judge from this note that there was present a condition of tortipelvis. Dr. Spiller tells me that this case was one undoubtedly of dystonia musculorum.

SUMMARY.

1. The patient has six near relatives, including her father, afflicted with Huntington's chorea, and one brother with dystonia.

2. The dissimilarity of this patient's symptomatology to that of Huntington's chorea. The absence of the choreiform movements of that disease. The peculiar pelvic movements so suggestive of the tortipelvic movements of dystonia. The bowing forward incoordinate gait. The cessation of all movements when at rest. As we know the choreiform movements of Huntington's chorea do not cease when the patient is at rest.

In conclusion, can we state with diagnostic finality that this is a case of dystonia musculorum? Is dystonia musculorum deformans a symptom group merely or an entity? There are undoubtedly many transitions which can be classed under the heading of dystonia lenticularis or the amyostatic symptom complex or myostasia of Oppenheim. Under this heading we have the pseudosclerosis of Westphar and Strümpell, Huntington's chorea, Parkinson's disease, spastic pseudobulbar palsy, athetosis, Von Bechterew's hemitonia apoplectica, carbon monoxide poisoning, arteriosclerotic muscular rigidity and certain forms of senile dementia which belong to Strümpell's amyostatic syndrome. Acute inflammation of the basal ganglia in lethargic encephalitis may cause the amycostatic syndrome. All the cases reported as dystonia musculorum do not present an identical syndrome. "Even Thomalla's case was atypical. The Babinski was not always negative and there were associated athetoid movements." Dr. E. M. Taylor's cases do not seem to me to present the socalled classical syndrome of dystonia musculorum. The cases were under the age of puberty, and presented definite choreiform movements of the extremities; the incoordination started in the extremities. In one case with no dementia there was present the striking pelvic tilting; the other case with marked dementia (sister of the other) did not present the pelvic picture. As Taylor says, "Dystonia musculorum has a divergence in symptomatology. A great variety of irregular movements can be described under the general category: Torsion, tortipelvis, dromedary gait, athetosis, choreiform movements, tremor propulsion, atonia, hypertonia, none sufficiently characteristic. Under the term of amyostatic symptom complex are included the extra pyramidal lesions as follows: Wilson's disease, pseudosclerosis, double athetosis, paralysis agitans, juvenile paralysis agitans and dystonia. In the words of Jelliffe, "Dystonia is only one of the striking types of the varying clinical trend of the group of the striatum syndromes."

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Endocrine Aspect of the Feebleminded and Epileptic Child

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The feebleminded child is a cause of much concern to parents and society. In one of my cases, a boy twelve years old was reported to be backward in his work, acting awkwardly and queerly at school, and making no progress. A physical examination disclosed 20/100 vision for both eyes. Corrective lenses changed the boy completely, as to behavior, mental retentiveness and work. He was able to see people, articles in window displays, etc., which he could not see before, and accounted for his awkward walk which was referred to as bad behavior. Retarded mental development in a child may be functional, as from defective eyesight, adenoids, diseased tonsils, defective hearing, malnutrition and trauma. The great number of mentally weak children is fortunately beginning to attract serious attention. The Russell Sage Foundation found in thirty-one American cities that over twenty per cent. of the school children belong to the retarded class. From the etiological point of view, however, mental deficiency is only a symptom seen in the variety of cerebral lesions, and the clinical manifestations may be the same, whether the origin of the lesion be a congenital developmental anomaly or some lesion acquired in extrauterine life. We must also think of hereditary influence, consanguineous marriage, endocrine disturbances, history of alcoholism, syphilis, cerebrospinal lesions, tuberculosis, and other physical stigmata in the parents which may be strongly suggestive of intrauterine influence as a factor in the production of defective development of the brain.

We are now able to grade the various degrees of backward and mentally defective children in our schools by means of the Binet and Simon method. These children are now being identified and properly classed and cared for and saved the brutalities which formerly were meted out to them when their defective work and slow progress at school were attributed to laziness, arbitrariness or stupidity. McCready, in discussing the subject of the backward child says: "The majority of backward children in whom the backwardness is not due to accidental causes, such as illness, lack of training and other purely environmental influences, present evidences of ductless gland irregularity, emphasized often in some particular gland."

References to the syndrome hypoplasia are now being seen in the literature on the retarded, backward, or deficient child and, according to Noble, the hypoplastic individual is one whose nutrition and development is below par, the condition being congenital or acquired during infancy or early childhood. There are varying degrees of hypoplasia reaching from backwardness, which is often not observed until the child has been in school for some time, to the serious organic endocrine abnormalities. It is difficult to say how much of the symptomatology of this condition of hypoplasia may be referred to the thyroid gland. Hertoghe refers to it as thyroid inanition. McCready states that malnutrition and a lack of bodily tone are practically the rule in mentally deficient children. He says of hypoplasia: "The hypoplastic backward child is distinguishable from his normally constituted fellow through anatomical, physiological and psychic characteristics, the interpretation of which serves to implicate the glands of internal secretion, as a factor of etiological significance."

In the scale of the mentally deficient, the feebleminded are one step below the socalled backward children. Raeder, of Boston, studied one hundred cases of feeblemindedness that came to necropsy. The cases were taken in chronological order from the pathological service of the Massachusetts Commission on Mental Diseases. Twenty-one per cent. of the cases showed decided changes in the glands of internal secretion, while fifty-three per cent. showed a lesser degree of glandular involvement. All of which merely establishes still further the fact that the endocrines are almost invariably involved in feeblemindedness.

The feebleminded baby may be extremely quiet, with prolonged periods of slumber, lying passively in any position in which it is laid down, scarcely ever moving its hands, feet or eyes. Such a baby may be a hypothyroid or dyspituitary type or other type of dyscrinism taking a pathological hold on it and, therefore, if the early abnormal condition is not recognized, is in special danger of neglect regarding its mental condition, for it is certain to be called a good baby by its mother, who is able to get so much done each day because of its abnormal quietness. Later on, when walking time is approached, the unfounded complacence of the parents will turn to dismay as they see months and even years come and go, without their child making an attempt to take his first step.

IDIOCY.

This term is applied to a condition in which the mental development is never beyond that of a normal child of two years. Imbecility is a slightly higher grade of mentality which at its height is never beyond that of a normal child of seven years. In a moron the degree of mentality is never beyond the normal child of twelve years. There are still milder grades of mental deficiency or backwardness which, however, are difficult to detect in children ordinarily, except with the aid of the Binet and Simon tests. These cases are usually spoken of as high grade imbeciles.

We are now able to place the entire field of idiocy upon a more rational plane than heretofore. In hypothyroidism and myxedematous infantilism we find types of mental deficiency in which the thyroid apparatus is at fault. It seldom shows itself within the first year, especially in breast fed babies because they receive through the maternal milk enough thyroid secretion to compensate for any deficiency that their own gland may have acquired *in utero*. Later on they usually show all the evidences of hypothyroidism. When these cases are detected early, thyroid extract in small and graduated doses kept up for a long time gives remarkable results. In older children we may detect early evidences of dyspituitarism as in Froehlich's disease. In such cases we may observe a mental condition showing a high grade of imbecility in which mental apathy, dullness, childishness and delusions are merged in with active mental symptoms and irresponsibility. These conditions are helped materially with anterior pituitary substance, thymus and thyroid.

The symptoms of idiocy vary according as the individual represents a high or low grade of this condition. Idiots may have normal crania, hydrocephalus or microcephalus. In the lower grades there is usually some physical malformation in connection with the mental impairment. The temperament may be violent or good natured, the mood often alternating. The sense of morality is wholly lost and they are very cruel to animals and even children. They show an early indication of perversity. In the severer forms, their muscular movements are incoordinate, irregular and awkward and their speech almost unintelligible. The idiot does not take notice of surrounding objects even if sight and hearing are perfect. He may have strabismus, weak musculature with all sorts of spinal orthopedic deformities, and is unclean and drooling. All these symptoms indicate that the interdependent functioning of the ductless glandular system is at fault. Each individual patient requires prolonged observation and study to distinguish between the simple backwardness, the mild and the severe forms of mental deficiency, in order to institute the proper treatment and give the prognosis. The degree of mental development which can be obtained in these cases and the possibility of the child leading a future life at least partially useful, depend not only upon the extent of the lesion, but also upon the skill with which the treatment is employed. We must treat the physical defects and correct the faulty endocrines, improve the home surroundings and environment and give the child every advantage of expert mental training and education. Barr has well said: "The backward child is not a mental defective but a mental invalid, so to speak, possessed of all his powers, and has the same chance of obtaining mental vigor that any sickly child has of being brought to normal health when given the proper treatment."

MONGOLIAN IDIOCY

This type is characterized by the striking resemblance of the little patient, even at birth, to a Mongolian, particularly a Chinese. They often suffer from middle ear disease, adenoids, and diseased tonsils. They have low resistance, faulty metabolism and cardiac atony. They show a lack of thyroid, anterior pituitary and adrenal secretions, and also thymus. Timme found röntgenologically an excavation under the anterior portion of the fossa pituitaria. The mental status can be materially improved, but at the cost of much patience and perseverance. The prognosis is as a rule unsatisfactory.

AMAUROTIC FAMILY IDIOCY.

This is another disappointing condition, familiar in type and always fatal. The infant may be normal up to the first year or so and then it will more or less cease to grow physically and mentally and become pale, weak and blind. The macula lutea is cherry red. They may have convulsions.

THE ADRENAL TYPE OF IDIOCY.

Apert, Morgagni and others found atrophy of the adrenal cortex in anencephaly in a few cases of congenital hydrocephalus and microcephalus. It seems that this part of the adrenal gland is necessary for the proper development of the brain. The lack of its secretion and also that of the medulla has been shown to restrain correspondingly the growth of the neurons, thus leaving the brain in a state of partial development and a correspondingly marked degree of idiocy. These patients have shown diminished lymphocytes, small thymus and stigmata of hypoadrenia.

THE THYMUS TYPE OF IDIOCY.

The delay in the development of the brain, illustrated by idiocy in children with a small thymus or none at all, indicates the constructive influence of this organ. These mental defectives show defective bony development, bone deformities, rickets and defective assimilation of calcium and low phosphorus serum concentration due to deficient thymic nucleins with defective growth and mentality. Sajous states that in twenty-eight mentally weak and epileptic children examined by Bourneville the thymus was absent in twenty-five, and that in another series of 292 cases it was absent in seventy-four per cent.

As to the cretin type, Hoag reports the case of a girl who came under his care at the age of three and a half months. Her appearance was that of a typical cretin. He began thyroid treatment at once. When the child was five and a half years of age she weighed forty-three pounds and was forty inches in height. She talked and played like all normal children for her age. She receives now three grains thyroid daily. This case is an example of what excellent results can be obtained in cases of cretinism if medication is begun early enough.

TREATMENT OF FEEBLEMINDED CHILD.

Considering the treatment for mental defectives or backward children, the feebleminded and idiots, we find many of them defective pluriglandular victims. The pineal, pituitary, thyroid, thymus and adrenals may be one or all at fault. Sajous states that "any disease capable of injuring the ductless glands sufficiently to inhibit their functional activity will inhibit the activity of the brain, by reducing the supply of secretions this organ requires to carry on the physiological processes." In the majority of functional cases of feebleminded and backward children met in current practice the predominating pathogenic factor is hypothyroidism, though the deficiency of the other internal secretions is also discernible in most instances. Whenever the father or mother is a mental defective and shows sluggish activity of one or more of the ductless glands, organotherapy should be instituted before and when pregnancy is recognized. Dana and Berkeley have reported good results in the administration of pineal extracts at certain institutions for the feebleminded. As a rule, however, pluriglandular therapy properly given only when indicated is more effective. Charles Herrman reported three cases of sporadic cretinism in one family who showed marked improvement when given a combination of extracts of thyroid, pituitrin and suprarenal glands. I had many patients who did well on pluriglandular formulæ and others that did well on thyroid extract only.

Glandular therapy must be used persistently. Watch results carefully and modify according to progress and symptoms. Use every associated effort that will favor improvement, being particularly attentive to proper elimination and mineral salt metabolism.

EPILEPSY.

This condition was known as far back as medical literature extends into antiquity. In the Hippocratic writings we find it characteristically described. Beyond this, the knowledge of epilepsy as to its etiology and therapy made no essential progress for many centuries. Innumerable hypotheses, even theological and philosophical, were advanced and rejected. None contributed anything whatsoever to positive knowledge. It may be said, however, that within the last twenty years material advances have been made (practical, experimental and clinical) to explain many phases of epilepsy, as to its symptomatology, classification, etiology, physiochemicobiological, cellular, and other pathogenesis and therapy, and advanced us at one time more than the twenty centuries taken together. L. Pierce Clark has made a study of thousands of seizures in epileptics and concludes that the principle of the pathogenesis of the condition is an initial toxin or autointoxication —an accumulation of waste products. The literature and clinical experience show plainly that the dominant note in the pathogenesis of the convulsions is impairment of metabolism, and that the spasmogenic agent is some toxic element in the blood stream. Pathological variations of vasomotor action due more or less to a morbid condition of the blood, have also asserted themselves so strikingly in the production of fits that some observers have been inclined to regard them as the foundation of the whole symptom complex. We thus have a cause of the convulsions in an epileptic—the toxins in the blood capable of producing high vascular tension, rapid flow of the blood stream and thereby bringing about excessive hyperemia of the cortex. This hyperemia is a recognized cause of epileptic seizures.

In some cases the causative factor or toxemia is primarily due to toxins derived from intestinal stasis, intestinal and sigmoid ulcers, carious teeth, sinusitis, adenoids, tonsillitis and other focal infection points of bacterial origin. Other sources may be from reflex origin, such as intestinal worms, indigestible foods, dentition, nervous shock, masturbation, syphilitic lesions, urea retention, hereditary diathesis or idiopathic form, alcohol and lead poisoning. Local conditions as tumors, sclerosis, cicatrices, nuclear degeneration and marked gliosis are among the hopeless cases wherein trephine or flap operation with hygienic and dietetic treatment with the aid of small doses of thyroid to enhance metabolic processes and lessen accumulation of waste, minimize the number and severity of the seizures. As to the other causes mentioned above a careful search must be made in every case and eradicated before much can be expected from organotherapy.

Heredity plays an important part in predisposing the one afflicted, such as syphilis, alcoholism, insanity, tuberculosis, rheumatism, mild and advanced cases of endocrinopathies, intermarriage and consanguineous marriages which give a bad start in life to the offspring. Proper prenatal education and treatment for the parents often helps materially in eradicating this source.

Toxins anywhere in the organism, either from within or without, will affect the ductless glands and in a way exhaust and cripple their usefulness to the human economy. This in turn brings about faulty metabolism, faulty growth, increases accumulated wastes, henceforth increasing the toxemia and nerve irritability. Postmortems in cases of epilepsy have shown in nearly every instance the principal organs of internal secretions to be involved. Clinically, when administering endocrine therapy where indicated I have obtained excellent results from both monoglandular and pluriglandular formulæ. The human organism must maintain its hormone balance. It is up to the tactful clinician or keen observer to note the upsets or disturbances of this balance in his patient, and by means of proper endocrine therapy add to the insufficiency or supply the neutralizing internal secretion, such as placenta and mammary against ovary, pancreas against thyroid, etc., thus readjusting the hormone balance improving the epileptic in many instances. In many such properly treated cases there was no return of the epileptic seizures for years after treatment was instituted and thus considered cured.

Briefly, in the treatment of epilepsy the main object should be to activate catabolism of spasmogenic wastes, enhance oxidation processes to keep the blood free from abnormal accumulation of toxic wastes or vasomotor irritants; dietetic measures to reduce the quantity of such wastes formed and finally to cause rapid elimination of those wastes through increased urination, perspiration and through proper bowel function. To meet these indications, the adrenals and thyroparathyroid apparatus must be functioning normally for proper tissue oxidation.

The thyroid gland deals more directly with cellular metabolism than any other gland of internal secretion. Prior, Jones, Hertoghe, Rothchild, Harrower, Levi and myself have repeatedly observed the association of epilepsy with thyroid abnormalities. Its insufficiency causes general bodily sluggishness, skin and intestinal infiltrations, constipation and autointoxication, and diminished alkalinity of the bodily vital fluids as is noted in many of the epileptics. I had wonderful results in many cases from administering thyroid extract in small doses, only half a grain three times daily. We must not lose sight of the fact that the parathyroids control the destruction of toxic substances which seem to have a special predilection for attacking the nervous system. MacCallum and Vogtlin, Ott and Biedl, have shown conclusively through extensive experimentation the relation between calcium metabolism and parathyroid function. They have also shown that calcium salts stop convulsive seizures and tetany resulting from parathyroid extirpation. Prior and Jones found before an attack there was an increased amount of calcium and diminished amount of phosphorous in the urine, diminished amount of blood alkalinity and fall in the leucocyte count. After the attack there is found an increase of leucocytes, increase of phosphorus and chlorides in the urine and an increase of calcium and alkalinity of the blood. There is therefore hardly a doubt that calcium metabolism plays an important rôle in the etiology of epilepsy. Schaffer states that the parathyroids yield to the blood a special autocoid substance of a chalonic or restraining nature which prevents overexcitation or discharge of nerve cells. Paton believes the guanidine precipitating calcium plays the important rôle. There is no question in my mind but that parathyroid insufficiency enters in as an etiological factor in the epileptic seizure.

Cushing pointed out repeatedly that pituitary insufficiency resulted in epileptoid states. The experimental work of Benedek and Schaller showed also that dyspituitarism caused epilepsy. Victor Horsley, experimenting with dogs, removing their pituitary glands, found upon electrical stimulation of their cortex that they were more sensitive. In many instances we find patients with a positive Sergent's line. This indicates hypoadrenia, after it is exhausted from supplying the pressor principle compensating for the diminished pituitary function. It is interesting to note the intimate relationship existing between the superior cervical ganglia, by way of the internal carotid and the pituitary, also how it is interrelated with the chromaffin system generally, the intimacy of the adrenals thereto, and the entrance of its pathogenesis as an etiological factor in epilepsy. The nucleins and phosphorus metabolism enter as important factors in the integrity of the nervous system. Douglas Symmers found on autopsy of many epileptic children that they were cases of status lymphaticus, and advised x ray therapy to counteract lymphoid tissue proliferation. Some cases show a combination of thymus, pituitary and adrenal dyscrinism in individuals as described by Walter Timme. In many of my cases I have combined parathyroid, thyroid, thymus gland substances (the latter controls phosphorus metabolism) with the anterior pituitary lobe extract which seem to have a favorable influence. Iodides and salicylates or salicin stimulate the adrenal centre and are synergistic. In certain cases the faulty element may be a diminution or absence of ovarian hormones, and in the male of testicular hormones which condition may cause an unbalance of the other glands and give rise to the production of circulating toxins and epileptic seizures. In these cases ovarian extracts and testicular extracts, respectively, are helpful. Strontium bromide may be used in very small doses before bed time in the severer cases to reduce the hypersensitiveness of the vasomotor centre, but if progress can be made without it, no bromides had better be given. When bromides and chloral are pushed we are doing the very opposite to that which we desire to accomplish—depressing endocrine functions and accumulating more wastes—and while we place the patient in a delusive calm by depressing or quieting his nerves we are aggravating the condition and sacrificing whatever chance one may have of being cured from this terrible affliction, and only serve to perpetuate the condition. Luminal one grain twice daily serves better than bromides.

The third indication or regulation of diet is important. Overloading the stomach, gulping down the food, and an improper diet are injurious. In the majority of cases the food intake is excessive, and the cellular elements are burdened with detritus which cannot be completely converted into eliminable products. The blood, therefore, is loaded with substances which irritate the vasomotor centre and thus provoke the seizures. We should therefore allow the patient only the quantity of food strictly necessary to the needs of the body. The best results are achieved from foods consisting of cereals, milk, butter, and fruits. Eggs sparingly and meat may be given in small quantities at the midday meal. Fats, fried foods and pastry often prove harmful and should be avoided. Stimulants such as tea, coffee and alcoholic drinks cause a rise of blood pressure and should not be taken. Everything possible must be done to prevent any disorder of the gastrointestinal tract. Daily flushing of the bowel by means of a colonic normal saline irrigation is very often curative in itself. One should drink water copiously to meet the next indication, that of rapid elimination of the wastes through the kidneys, daily systematic exercises to encourage diaphoresis, and proper attention should be paid to the condition of the bowels. All the emunctories must be kept functionating normally.

Where the etiological search reveals a focal infection at the roots of teeth, gum boils, furunculosis, infections of the nose and throat, urethra, prostate, and intestinal, sigmoid or rectal ulcers, an attempt should be made to get a pure culture of a bacterial strain from the focal area, and an autogenous vaccine made by a competent bacteriologist. This therapy has done good in several cases of epilepsy of intestinal origin with colonic infectious ulcers. Beside the indicated treatment in each case, a change of scene, plenty of fresh air and regulated mode of living are equally essential.

182 Lexington Avenue.

An Epileptic and Her Sixteen Children*

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A celebrated cartoonist has waggishly said, "Heredity is something a father believes in until his son starts to act like a fool!" Nevertheless, a father cannot gainsay this: heredity proves that an individual is very much more like his ancestors than he is like strangers.

In no sphere of medicine does bad heredity show itself so conspicuously as in the realm of nervous and mental diseases, and in these disorders it is also observed that like does not necessarily beget like; as will be illustrated by this family. Among distinctly psychopathic stock one may find such varied diseases and conditions as hysteria, epilepsy, feeblemindedness, alcoholism, psychoses, gross immorality, vagrancy, and even the greatest of moral obliquities—crime.

This study is of a household that was rendered distressingly poor through the circumstances of a blind father, and of an epileptic mother who scouted race suicide by living up to sixteen pregnancies, who clung tenaciously to all these maternal burdens save one—the tenth conception miscarried—but who still ran true to a total of sixteen, by reason of her first effort having brought forth twins. This family came to my attention in 1913 when six of its members were personally examined, and these furnished much information pertaining to the others, which data were for the most part subsequently verified by a social service worker.

THE PARENTS.

The mother, aged fifty-seven, was born of healthy parents who died in old age. A sister was epileptic. The mother's epilepsy declared itself at thirteen years but as the manifestations were mild, they were considered fainting spells. The attacks did not change in character until after her marriage at eighteen years, after which they became more frequent, showed the convulsive feature and ultimately developed into seizures of a very severe type. That matrimony causes a change for the worse is the rule with epileptics, despite the advice sometimes given in former years of this as a remedy for the disease. While there is nothing in the marriage relation itself to augment the disorder, the fact that one finds himself bound to another who is afflicted with an almost loathsome disease, renders the association quite intolerable, and it is this unbearable state which reacts upon the epileptic and causes an increase in the attacks. Of latter years this woman's major seizures had been occurring several times a month. Her appetite was ravenous. She was strong physically and between the attacks did much hard work which is most unusual for an epileptic. Her frequent pregnancies did not of themselves influence the seizures but labor was always complicated by convulsions. Status epilepticus occurred once but other ravages of the disease, such as insane periods and a decided impairment in mentality, were escaped. She was forty-five years old when the last child was born.

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The father, aged seventy-two, had always been of good habits. He became prematurely gray and had severe annual attacks of hay fever. He was thirty-five at the time of marriage and at fifty-four his vision began to fail. Double cataract developed and was operated upon, after which the right eye became infected and discharged. Following the operation upon his left eye, vision was unimproved. The man was sixty when their last child was born.

THE CHILDREN.

No. 1.—Male, aged thirty-seven, and twin to No. 2. He was shiftless, drank heavily, had had delirium tremens and at times while drunk had convulsions —whiskey fits, socalled. He consumed enormous quantities of black coffee. Owing to drunkenness and to general worthlessness otherwise, his wife had him arrested after which he was sent to jail. For breaking into her house and removing furniture, she had two of his brothers and one sister arrested. There was one child who had had two attacks of pneumonia.

No. 2.—Female, aged thirty-seven, and twin to No. 1. As a child she was a sleepwalker. Sleep was always troubled by much talking and dreaming, and there were periods when the amount of sleep was most excessive. I saw her in a state of such drowsiness that she dropped asleep during conversation. There were other unusual traits—she ate inordinate quantities of candy, craved salt, had a vicious temper, at times would hide herself for hours under the bed, and once she was arrested. She was married, there was one living child who had weak eyes, and there had been two miscarriages.

No. 3.—Female, who died at thirty-three years, following an operation for the relief of exophthalmic goitre. There were three children who were said to be healthy.

No. 4.—Male, who died at six months, following an operation on the abdomen.

No. 5.—Female, aged thirty-two. Was said to have had St. Vitus dance from six to thirteen years, and then she was cured by a priest, but immediately after that, epilepsy began. At eighteen years she became pregnant, but was married two months before the birth of her child. There were eight pregnancies in all, two of which terminated in miscarriages. She died suddenly, probably as a result of the epilepsy.

No. 6.—Male, aged thirty, who had been an alcoholic for twelve years, had had delirium tremens three times and had been arrested once.

No. 7.—Female, who died of marasmus at fourteen months.

No. 8.—Male, aged twenty-eight and healthy, but had one child who had had convulsions.

No. 9.—Male, who died of marasmus at seventeen months.

No. 10.—This was a miscarriage.

No. 11.—Female, aged twenty-six, who for six months had been manifesting a goitre. There was one living child and there had been twins but they died a few months after birth.

No. 12.—Male, aged twenty-two. Was born with a hernia and had always been a sleepwalker. He had been arrested once.

No. 13.—Male, aged twenty-one. Healthy and had one living child who was born two months after marriage. He did not live long with his wife.

No. 14.—Female, aged eighteen. Was healthy, married, and had one healthy child.

No. 15.—Female, aged sixteen. Was slightly defective mentally, and perhaps had Raynaud's disease. She had crying spells from attacks of inward pain. For about two years preceding my examination, patches of what may have been spontaneous gangrene had from time to time been appearing. They began with a slight elevation upon the skin and this was attended by a sharp pain which made her cry out as one might with the toothache. After some hours there developed a black patch, as though the tissue was charred, and then the pain would cease. One such area began while a tooth was being extracted. These patients, which healed in about five weeks, left behind them distinct scars. Once the whole arm became intensely swollen and the fingers felt numb. The hands and fingers blanched upon slight exposure to cold.

The gangrenous areas appeared as follows: 1. In July of 1911 patient burnt the middle finger of her left hand with lye and this she stated was an accident. The next day it looked as though it were charred and did not heal for several weeks. 2. The areas developed above the upper incisors and her mouth remained sore for a month. 3. They came on the anterior surface of the right arm and healed in about six weeks. At nearly the same time two small blisters appeared on the anterior surface of the right forearm, and these healed in about a week, leaving small scars. 4. About a year after the first attack a patch appeared on the fourth toe of the right foot. This toe was subsequently amputated without an anesthetic, in the Chester Hospital, but the stump continued black for six weeks. 5. A large area appeared on the back of the right leg. 6. A gangrenous area appeared on the end of the little finger of the left hand. 7. A small patch was seen on the back surface of the left arm which appeared while a tooth was being extracted. 8. The areas continued after and upon the site of a vaccination.

A dermatologist who saw this girl did not believe she had Raynaud's disease. He was of the opinion that such lesions could not result from a functional disorder, and, since it was stated that she had once burnt herself with lye—both she and her family declared it was accidental—he unhesitatingly classed her as a malingerer. I believe that rarely we see spontaneous gangrene, and the symmetrical distribution such as was observed in this girl is an important feature of the disorder. Furthermore, one patch of gangrene developed while she was a patient in a hospital, where it seems unlikely that a caustic could have been procured.

Finally there had been three sores upon her right upper extremity, and it appears improbable that a righthanded girl, who was a bit defective mentally, would be so adroit in her deception as to apply a caustic with her left hand. I inclined to the belief that the patches had developed spontaneously, though I recalled full well cases of automutilation that I had seen in the hysterical and in the insane.

No. 16.—Female, aged twelve. When between four and five years of age had had convulsions that lasted for hours. By reason of the presence of corneal maculæ, and a high degree of astigmatism, her vision was defective.

There is no sufficient reason for believing syphilis to have been a contributing factor in the production of these many disorders, though only three blood Wassermanns were taken and these proved negative. One miscarriage out of sixteen pregnancies, and in an epileptic besides, does not speak of syphilis, nor did the nature of the diseases in any of the family appear especially to have developed upon a luetic basis. The many affections and afflictions observed in the offspring seem to be due to epilepsy in the mother and such other hereditary trends as may have come down from her ancestors, and perhaps to some slight inherent physical inferiority on the part of the father together with his advanced age at the time of some of the conceptions. Only three of the children appeared to escape the blight and doubtless a small volume could be written upon the disorders which will develop among the early descendants of this ill fated family.

The Treatment of Epilepsy with Special Reference to the Use of Luminal*

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The treatment of the epilepsies presents many problems, owing to the fact that the pathology of these disorders is obscure. We speak of epilepsy as an entity, but in reality it is merely a syndrome in which the convulsive seizure is the most striking and easily recognizable symptom. The seizure may be brought about either through intracellular irritation of the nerve cell itself, probably through its own catabolic action, or through some extraneous force acting upon it. In either case the equilibrium of the cell is upset, destroying its balance, and the phenomena of the convulsive seizure appears, consequently we have two varieties of epilepsy, depending upon the intrinsic or extrinsic source of the nerve cell irritability. These correspond to the groups commonly called idiopathic or genuine (intracellular) epilepsy and symptomatic (extrinsic causes) epilepsy. The former is not a clear cut group and is left over, so to speak, from the class of these disorders where no exogenous cause can be found.

In other fields of nervous and mental disease attempts at classification have led to a better understanding of the conditions studied, and such an attempt has been made in the epilepsies in the hope that a grouping of these disorders would help in their treatment. However, our efforts in this direction have not been successful. There are several methods of classifying epilepsies. The old nomenclature consisted of grand mal, petit mal, Jacksonian and psychic. This form is only of descriptive value, as it refers to the type of seizure. Turner (1), of London, offers a classification in which the date of onset and the etiological factors are both considered. His classification is as follows:

1. *Organic epilepsies.*—Due to focal brain disease and trauma.

2. *Early epilepsy.*—Often marked by striking mental deterioration; includes some case of infantile cerebral palsy, birth trauma, encephalitis, and hemorrhage.

3. *Late epilepsy.*—May be due to cardiorenal vascular disease; intoxications, among which alcohol is important, and syphilis and other infections may be included except the focal manifestations of syphilis and tubercle; epilepsy associated with a psychosis; eclamptic conditions, developing into epilepsy.

4. *Idiopathic epilepsy.*—Comprising the residue of all cases and having no ascertainable cause.

The first three types mentioned above are due to exogenous causes and theoretically, on removal of the cause, the individual should recover. However, this does not always occur, as when the seizures have become fully established and have continued for some time certain destructive changes have taken place in the nervous tissues which can not be repaired. The only procedure in such cases is to endeavor to control the attacks by sedatives.

Idiopathic epilepsy usually occurs in early life. A child is born with instincts, emotions and endocrines of a type contributed by its parents and inherited from them and their ancestors. A careful study of the ancestry of individuals who have had epileptic seizures since early childhood usually reveals that they are the offspring of degenerate stock. The nervous system of children born of tainted stock is hypersensitive. They are unable to cope with the psychical shocks and diseases incident to childhood like the children of excellent ancestry. Ordinary stimuli produce deeper impressions and leave paths which can not be entirely obliterated. The aftereffects of a stimulus arousing the instinct of flight with the corresponding emotion of fear may at first be only a slight headache, vertigo, weariness, or night terrors, but as the threshold becomes lowered the effects become more pronounced. The reaction to stimuli other than psychical may form impressions which can never be erased. Malnutrition, disturbances of the endocrine balance, infectious diseases and constant irritation from whatever source on a hypersensitive nervous system may result in convulsions which, when once established, may reappear in the future on the slightest provocation.

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Epilepsy and feeblemindedness are closely related. It is a common dictum among institutional people that there are practically no epileptics without some mental change. Progressive dementia is the most striking of these, but there are epileptics who do not deteriorate as rapidly as others. The epileptic personality of egocentricity, hypersensitiveness and irritability predisposes them to lose contact with the world of reality, and when convulsive seizures appear leaving them confused and stuporous for long periods, they become mentally dull and childish from the constant psychic trauma. Children who are feebleminded may also be epileptic, and likewise when the mental defect is due to an arrest of development following an injury or inflammation, the occurrence of epilepsy at once or later in life is not improbable. It is, therefore, important from a prognostic viewpoint to differentiate primary or acquired feeblemindedness from that which is the result of epileptic dementia.

Epilepsy is believed to be inherited directly in some cases, as it can be traced according to the Mendelian law. Feeblemindedness has been proved to be hereditary. Dr. Goddard (2) points out that out of 482 cases where the parents were feebleminded only six were normal. It is, therefore, obvious from the foregoing that in order to decrease the number of feebleminded and epileptics, some method of regulating the offspring should be undertaken. Prophylaxis by legal means should be encouraged as far as possible, such as segregation, operation, and especially limiting marriage and educating the public to the dangers of matings between the unfit. However, this is a problem in eugenics and will not be discussed here.

We are chiefly interested in the treatment of the disorder and our first endeavor is to prevent the onset of the attack in individuals predisposed to the disease. Some success may be obtained if they are presented for treatment when the first features of the epileptic personality are manifested. The early symptoms of headache, irritability, nightmares, and hypersensitiveness should all be taken into consideration in diagnosing early epilepsy. However, as a rule these early symptoms are not recognized by their relatives, and if observed are considered of no importance. The treatment a child receives in early life governs to a large extent his behavior in the future. If measures are taken in the beginning to diminish or overshadow the harmful stimuli, future seizures may be aborted. Injurious stimuli may be removed or if psychical may be blocked, shifted or modeled into more pleasurable ones by experience, or through explanation or by play. After the seizures have become fully developed, the treatment consists of hygienic and dietetic measures and the utilization of agents to diminish the irritability of the nerve cells, thereby decreasing the number and severity of the convulsions.

The hygienic treatment of epilepsy, as in other conditions, consists of pleasant surroundings, good sanitation, proper exercise, and every means which places the body of the patient in the best physical condition. It also contains the idea of discipline, which will inculcate selfcontrol. Obedience to discipline and the resulting gain in selfcontrol is no small part of the treatment which is summed up in good hygiene. It is difficult to carry out the hygienic treatment of epilepsy at home. The relatives may be too ignorant to apprehend the wisdom of the measures advised and deliberately violate them, or they may, through their love and sympathy for the afflicted one, give them anything they desire and indulge all their wishes. If therapeutic results are to be obtained from hygienic measures, the best place for the patient is a suitable hospital or special institution. Experience has shown that it is not practicable to treat epileptics along with other public charges, as they tend to clash and to irritate one another. The seizures of the epileptic are very disturbing to the nonepileptic, while practically unnoticed by fellow sufferers of the same disease. The epileptic is usually sympathetic with others suffering from the same malady, is not unpleasantly influenced by their seizures, and may derive some animation from the fact that he is not the only one in the world who has convulsions. The question of suitable industrial therapy is important, but their value is largely indirect. By centering the attention of the epileptic on light occupational work, a flow of interest is directed to outside realities, causing him to forget his difficulties during the time he is engaged in the work. The value of work lies in the fact that regular work is an excellent form of discipline, and discipline of whatever form is valuable in overcoming the fundamental instability of the nervous system of the epileptic. The ability to stick to a given line of work means a gain in selfcontrol and represents an inhibition which spreads to all the cerebral activities. The kind of work is immaterial as long as it does not place him in positions where his seizures expose him to danger. Regular work is associated with a regular routine life, and regularity of eating, sleeping, working, and playing combined with discipline is in part the secret of the improvement of patients who live in institutions.

The subject of diet for epileptics has been discussed time and again. The theory has been advanced that a diet rich in proteins increases the frequency and severity of convulsive seizures. A diet rich in casein is thought to be especially injurious, as it is the only protein which contains three important aminoacids, namely histidine, tyrosine, and tryptophane. The importance of these aminoacids has been emphasized in recent years as a result of the great interest in the endocrine organs. These end products of the digestion of proteins are closely related chemically to adrenalin, pituitrin, and thyroxin and are believed to be used by the body in the manufacture of the latter substances; all of which disturb in one way or another the vasomotor system. Such disturbances may incite seizures in persons who have the epileptic habit.

In order to determine the merits of a low protein diet, a study was made by one of us (L. W.) in 1915 at St. Elizabeth's Hospital, Washington, D. C., on a number of epileptics classified as the idiopathic variety. They were given a very low protein diet for several months during which time attention was given to the bowels and the usual hygienic measures taken, but no change could be observed in the frequency of the attacks as compared with the same period preceding the special diet. The limitation of the amount of food taken seems to be of far greater importance than selection of the articles consumed, since it is characteristic of epileptics to gourmandize. The amount of food given should be kept at or near the physiological minimum and attention given to elimination especially from the bowels.

The only method of controlling the number and severity of the attacks rests on the properties of certain drugs to inhibit the activity of the nerve cells of the cerebral cortex. The drug most frequently employed, since it was introduced by Laycock in 1857, has been some preparation of bromide. In certain cases this drug, when rightly handled, often yielded favorable results, but in the majority of cases it failed and whenever administered for any length of time was always attended by disagreeable aftereffects. The old methods of administering bromides where large doses were given resulted in decreasing or stopping the seizures, but the aftereffects were worse than the convulsions. The patient became dull, stupid, apathetic, suffered from digestive disturbance, and from an acne which was exceedingly annoying, especially as it often became infected, leading to furunculosis.

Many other sedatives have been used to control epileptic seizures, but were gradually abandoned in favor of bromides. Veronal or barbital was advocated for a time but fell into disrepute because of its toxic and habit forming qualities. In the search to remove the toxicity of veronal the Germans produced a preparation known by the trade name of luminal. Luminal or phenylethylbarbituric acid differs from diethylbarbituric acid (veronal) in that one ethyl group (C_2H_5) has been replaced by one phenyl group (C_6H_5).

In 1912, Hauptman (3) of Germany, was the first to report a series of cases of epilepsy which were treated with this drug. According to his report, the results were excellent. The convulsive seizures disappeared in most of the mild cases and in the more severe cases the attacks became milder and at more distant intervals. He also noted that there were no untoward effects from the administration of this drug. After this report there appeared sporadically in the German literature reports of the use of luminal in the treatment of epilepsy, and all were of the opinion that it was the best available drug for use in idiopathic epilepsy. Some stated, however; that its withdrawal brought on convulsions of a more severe type and at more frequent intervals. The first report of luminal in this country appeared in 1916 when Dercum (4) discussed its use in the treatment of epilepsy at a meeting of the Philadelphia Neurological Society. He found that luminal exercised a remarkable control over the seizures, reducing their number as well as curing many of them entirely. He administered a dose of one and a half grains of luminal or two grains of luminal sodium at bedtime, after the patient had received a course of bromides as preparatory treatment. He found no deleterious or untoward effects in his results. No further reports were made regarding this drug until after the war, when Grinker (5) published an article on the treatment of epilepsy. Since the appearance of his article various reports have been published in which the consensus of opinion is that luminal is the best drug known for controlling epileptic convulsions.

Luminal was first used at Corozal Hospital in September, 1920. Since then we have administered the drug to eleven females who have had convulsions for several years. In two of the cases the seizures are symptomatic of organic disease of the brain, while the remaining nine are of the idiopathic variety. No previous medication was given prior to the administration of the luminal and no changes were made in their diet or hygienic treatment. Luminal was administered in doses of one and a half grains daily at bedtime in all the cases except one in which the attacks were so severe that a dose of one and a half grains was given twice daily.

The results obtained by us have not been so striking as those reported by many others. However, we are able to demonstrate by comparison that there has been a diminution in the number of seizures. The total number of convulsions recorded for four epileptics for one year preceding the administration of luminal was 198, while the total number of seizures for the same patients during the first year of treatment was 120; a decrease of seventy-eight. or approximately forty per cent. These four patients were selected because they were the only ones who had resided in the hospital a year or longer prior to the beginning of the treatment. Luminal also diminished the severity of the seizures in the majority of the cases. They were milder and of shorter duration.

One of the most remarkable effects is the change it produces in the mental attitude of the patient. The dull, surly, irritable epileptic is more cheerful and cooperative. We have observed no ill effects in any case, and nothing that would lead us to believe that it is a habit forming drug. There have been no skin eruptions and no digestive or circulatory disturbances.

The drug is not, however, entirely devoid of unpleasant results. Its power to inhibit convulsive seizures is not permanent. In most of the cases, when it is discontinued the convulsions return with greater frequency and severity. The use of luminal must not be discontinued abruptly, as a status epilepticus may result. One of our patients, a female epileptic, who was having an average of ten convulsions a month while receiving luminal, had 304 seizures during the first six days following the abrupt discontinuation of the drug. Similar results occurred in two other cases on discontinuing the drug abruptly, but were not so marked.

We are unable to report on the effects of large doses of the drug as we have never given more than three grains to one patient in twenty-four hours. However, German observers warn against the use of luminal in doses of more than 0.3 grams (4.62 grains) in twenty-four hours. Toxic symptoms resembling those caused by veronal poisoning have been reported by Farnell (6) and others who gave it in large doses for hypnotic purposes. We have given it in doses of three grains every twenty-four hours a period of several days in cases of excitement, but no beneficial effects could be observed. When luminal was accepted as a new and nonofficial remedy by the Council of Pharmacy and Chemistry of the American Medical Association in 1913, it was said to be a useful hypnotic in nervous insomnia and conditions of excitement. The dose recommended was from three to five grains increased if necessary to twelve grains. However, experience has shown that it is too dangerous to give large doses for hypnotic purposes and that luminal is more nearly a specific for convulsions than any drug we have at our disposal.

CONCLUSIONS.

Luminal as a palliative drug is far superior to bromides in the control of epileptic seizures.

Luminal in doses of one and a half grains daily may be safely given over long periods.

Luminal produces a marked improvement in the mental attitude of epileptics.

The use of luminal should be discontinued gradually to prevent the occurrence of a series of convulsions.

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Eugenics versus Epilepsy*

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The old adage of the Romans, *mens sana in corpore sano,* is, in a nutshell, the basis of this paper, as prophylaxis is worth far more than cure—if cure is ultimately found.

Some one has said that we are, mentally and physically, what our glands make us, and therefore how essential it is to have progenitors with healthy glands. Given healthy parents, scientifically mated, good hygienic surroundings, with a well balanced diet containing the essential chemical elements and vitamines, the child has a biological beginning which will generally withstand successfully the vicissitudes of life and the onslaughts of disease; with the proper training and care he may be able to maintain the balance of health throughout the life cycle.

It is a truism to say that the mating instinct is as old as life itself, but it is only comparatively recently that science has been brought into play and used as a guide in the place of blind passion or sentiment, and thus the science of eugenics was born. Too little attention is paid by the human race to this important and vital matter, either from a national viewpoint as a matter of political economy, race betterment and conservation; or from the individual and common sense viewpoint of those who think and desire a future for themselves and their children.

Experimentally, it has been shown what marvels can be accomplished by the scientific breeding of fowls, hogs, horses, dogs, and other animals; then why not the human race? It is safe to say that at least sixty per cent. of all mental and nervous diseases could be prevented or eliminated by healthy parents, scientifically mated in the true biological sense, and this includes epilepsy, with which we of The Village have to deal; for a faulty heredity, a defective germ plasm, with a biological or physiological insufficiency and instability of the nervous and endocrine systems, is an essential factor in the etiology of all cases of true epilepsy.

So prophylaxis is ninety per cent. of the cure, and until the medical profession, as well as the laity, realize these facts, we cannot hope to make much progress toward the eradication of this dread disease, or of certain types of mental disease.

It is true that the legislatures in a few states in the United States have seen the menace in a dim way, and have enacted certain prohibitive laws requiring a physical examination and medical certificate of health, from both man and woman, before issuing a marriage license; and also the operation of sterilization in the case of criminals, which is a step in the right direction; but the laws are evaded, or laxly enforced, due to adverse public opinion and ideas of personal liberty. New Jersey was among the first to enact the law relating to eugenic marriage, as well as the sterilization of feebleminded persons, idiots, imbeciles, morons, epileptics, rapists, criminals, and other defectives, which passed the Assembly in 1911-1912. It was introduced by Blanchard White and fathered by the superintendent of this institution.

The public needs to be educated and its opinion moulded and crystallized before we can make any real progress in eugenics and preventive medicine and eliminate the untold misery and economic loss from disability due to nervous and mental disease, as well as other diseases due to defective vitality. Eugenics is a broad subject and involves, not only biological and physiological health, but questions of environment, hygiene, proper food, morals, and right living.

Not by any means are all clonic convulsions epileptic, as convulsions result from many causes, both exogenous and endogenous, from the cradle to the grave—as witness the spasms or convulsions of the infant with worms, indigestion or cholera infantum, as well as the convulsions due to puerperal eclampsia or paresis; so more care should be used before making a final diagnosis of epilepsy in any given case and instituting treatment.

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*Read before a joint meeting of the medical societies of the Counties of Mercer, Middlesex, Hunterdon and Somerset, at the New Jersey State Village for Epileptics, Skillman, N. J., June 15, 1922.

As the etiology of epilepsy is still speculative, and *sub judice* as to whether the ultimate exciting cause be due to toxins of a protein nature in the blood stream, to autointoxication, or to deficiency or disharmony of the endocrine secretions, so the treatment is still in the experimental stage, and while the gamut has been run from the earliest days of "casting out devils" through silver nitrate, borax, bromide, horse nettle, etc., down to the present vogue of luminal, yet no *specific* has been found, no panacea, no balm of Gilead, but the patient is treated symptomatically and hygienically, and kept in the best physical condition and the most cheerful frame of mind. Luminal will hold the fits in abeyance more or less for a certain length of time, and nearly all of the advertised cures of today contain it, but it offers no permanent relief.

Further study and research are needed. When we consider the great abdominal brain, the solar plexus, and the vast domain it, with its ganglia and ramifications, governs or controls, including the organs of digestion, assimilation and elimination, and the intimate association of the sympathetic nervous system with the circulation and all the processes of secretion, excretion and metabolism, the autonomic or automatic functions, including the ductless glands, it seems to me that it is the etiological field to investigate in epilepsy (as well as certain mental diseases) rather than the contents of the cranial box.

Any irritant in the blood stream may, after prolonged attack, cause the cortical neurons through their dentrites to send out disharmonious, or defensive, impulses throughout the body, thereby producing a convulsion with attendant relaxation and frequently elimination, in an effort to protect the organism as a whole. *Cell intelligence must be recognized.*

Dercum in a recent essay entitled *The Psysiology of the Mind,* offers much food for thought along this line.

Radium in the Treatment of Diseases of Women*

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The successful treatment of diseases peculiar to women will always be difficult because of the fact that pathological conditions are seldom reported until the disorder is far advanced. The unselfish motive which prompts many women to hide their ailments in order to prevent any anxiety on the part of their friends is, of course, praiseworthy, but shortsighted, for too often during this period a benign condition which might have been easily treated has become malignant, or a malignant condition has been advancing beyond the stage where definite aid might have been given. The fear of cancer and the fear of surgery contribute to the cause of delay. Both these fears, however, should be greatly mitigated when radium therapy becomes more widespread, for, with early consultation, the chances of cure by means of radium rather than the knife are very much higher. Then, too, radium treatment is easily undertaken, it is not painful, and, except where very heavy dosage is employed, it has no serious or untoward after effects. One cannot urge too strongly the necessity of warning patients of the danger inherent in any abnormality of function or of tissue, no matter how minor such disorders may appear. Such warnings cannot be reiterated too frequently, for, unfortunately, the disease is often well advanced when the first signs of disease are evident. However, the patient is not always the culprit. There is, very often, too great laxity on the part of the physician. Speaking of cervical cancer, Bandler (1) says: "The failure on the part of the physician to make a thorough bimanual and tactile examination and to examine thoroughly with the aid of a speculum and the use of the sound; . . . the failure to consider all cases at this period and even much earlier as malignant unless another diagnosis can positively be made; all these are factors in making cervicouterine carcinoma the almost hopeless disease that it is."

CANCER OF THE BREAST.

There is diversity of opinion as to the best method of treating cancer of the breast, but there is practical unanimity on the advisability of operating in operable cases. However, it is now generally conceded by surgeons of liberal views and wide experience, that preoperative exposure of breast carcinomata to radium is most important. Not only the breast itself, but the whole area about any tumor mass is fully rayed from six days to three weeks before operative procedure is undertaken. This has the effect of closing the lymphatic channels, and thereby thwarting metastases. Every patient in whom the breast has been removed for carcinoma should receive postoperative radiation. This may be given early, before the sutures are removed, and should be repeated in six or eight weeks. The histological changes which have been shown to be produced in radiated tissues prove that the effect must be of benefit, and clinical evidence justifies one in that opinion. It is not uncommon for small nodules to develop along the line of suture after amputation of the breast. Radium treatment will cause disappearance of these masses without recourse to further surgical procedures.

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*Read at the meeting of the Ontario Medical Association, Toronto, June, 1922.

A patient, thirty-six years of age, had had the left breast removed for carcinoma in October, 1914. In May, 1915, she noticed some areas of thickening along the lower end of the line of incision. There were four separate nodules, each about as large as a split pea. Exposure of these points to 120 milligram hours of radium treatment resulted in their complete disappearance.

The treatment of inoperable cancer of the breast has not yet been standardized. Pfahler (2) maintains that such cases should be treated by the introduction of radium needles into the mass. This is followed by a shrinkage of the mass, and, in some cases, operation is made possible. This treatment is moderately new, and it is really too soon to estimate its value. Clark (3) favors the use of radium or x ray both before and after all breast operations. He states that large, superficial, ulcerative carcinomata of the breast often respond beautifully, shrinking rapidly and granulating over with healthy tissue.

CHRONIC MASTITIS.

Correct diagnosis is of the utmost importance. The development of carcinoma of the breast is usually well advanced before nodules appear. For this reason and because of its rapid development the great cry has been for operation as soon as possible. However, this view must certainly be modified in face of the results obtained by the use of radium in chronic mastitis. In this condition one often finds axillary glands associated where the involvement is purely inflammatory. The beneficial effects of radium in chronic mastitis are well exemplified in the following cases:

Case I (No. 985).—The patient, a woman, aged forty-five, presented a condition of an irregular nodulated mass in the right breast three quarters by two and a half inches. As a small drop of pus could be expressed from the nipple the condition was diagnosed as inflammatory and operation was advised against. Radiation was given in May, 1917. The patient did not return for two years, during which time she had been in good condition, but had experienced some pain in the breast. In March, 1920, and subsequently, deep radiation was given. In June, 1921, induration had materially lessened, but there was a small ulcer of the nipple, which was thoroughly rayed. When the patient was last seen in November, 1921, her condition was entirely satisfactory.

Case II (No. 309).—The patient, aged forty-seven, had had a lump removed from her left breast in 1906. There was no recurrence, but a lump developed in the right breast subsequent to operation. It had gradually increased in size and occasionally gave rise to some pain. When first seen, in August, 1912, the mass was about two and a half by three and a half inches and was freely movable. Radium treatments were given at six week intervals until February, 1913, after which time she was considered to be clinically cured. In March, 1917, she reported, and examination showed the breast to be soft and pliable, no mass could be felt, but a small gland was present in the axilla. In August, 1919, examination showed total disappearance of the tumor mass and enlarged gland.

Case IV (No. 1795).—This patient, aged forty-seven, showed fully developed breasts with both nipples somewhat firmer than normal. The left nipple showed commencing Paget's disease, with a small ulcerating area. A treatment was first given with a light, unscreened, flat applicator for six hours. This was followed after a month by a heavier and deeper raying. At intervals afterward, treatment was repeated with the result that the patient was freed from disease.

Case V (No. 2620).—The patient, aged seventy, had experienced roughness and scaling of the left nipple for about two years. During the previous six months the lesion had increased in size and tenderness until, when first examined, the ulcerated area was about two inches in diameter, slightly indurated around the nipple. A heavy radiation with a plaque four cm. by four cm. containing ten milligrams of radium element was given at this time, and again later when reaction had subsided a prophylactic dose was administered. One month later the condition presented a normal appearance with no evidence of disease.

CARCINOMA OF THE VAGINA.

Carcinoma of the vagina is a rare condition and one which does not respond well to surgery on account of the very extensive distribution of lymphatics. It has been treated with radium, however, with much more success. Stacey (6) reports fourteen cases in all of which the local condition was controlled, although extension was not prevented. She considers that radium and x rays hold out much better chances of cure than surgery.

CARCINOMA OF THE VULVA.

The results obtained by the use of radium in carcinoma and epithelioma of the vulva are much more encouraging. I have not met many cases, and they have, in some cases, not been satisfactorily followed up, but certain results in this condition have been excellent.

Case VI (No. 654).—The patient, aged seventy-eight, had an epithelioma of the right labium excised in October, 1914. She reported for radium treatment in December, 1914, when a thorough radiation of the area was given. In June, 1915, when she reported for treatment enlarged glands had appeared in the left groin three months previously. These were removed surgically, and showed squamous celled carcinoma. The area of operation was then fully rayed and in August there was no sign of recurrence. The condition showed no sign of disease in December, 1915. In view of the extensive glandular involvement at the time of operation this is considered a most satisfactory result.

Case VII (No. 393).—For four or five months before being seen the patient, a nullipara, aged twenty-seven, had noticed a constant discharge from the vulva. At first watery in character, it gradually became thicker in consistence, and was occasionally bloodstained. For two months she had noticed a swelling in the vulvar region, and during that time there had been occasional twinges of pain, but these were never severe. "On examination a fungating mass was found filling up a considerable part of the vestibule. In the centre of it the orifice of the urethra was situated. The growth extended more toward the floor than the roof, and infiltrated the lower wall to a distance of half an inch above the orifice. The surface of the growth was hard, friable, and bled easily. The inguinal glands on both sides were large, hard, and matted. A piece was excised from the primary growth and examination showed it to be squamous epithelioma." A free operation was done, removing a portion of the mons veneris, and upper parts of the labia majora, the body of the clitoris, labia minora, the vestibule, and lower part of the anterior vaginal wall. The removal of the inguinal glands was undertaken ten days later. The patient made an excellent recovery. To guard against recurrence she was given radium treatment in the form of flat applicators. This was begun two months after the first operation. She had several exposures on successive days, making a total of 270 milligram hours. Three weeks later she had further successive exposures, amounting in all to 600 milligram hours to the vulva, and 150 milligram hours to the groins. A month later she had two further exposures. As a result of this radiation the vulvar and inguinal scars became quite soft and pliable. There has been no recurrence. She subsequently married, had a child by Cæsarean section, and is now well, nine years after the operation.

CANCER OF THE UTERUS.

When we come to carcinoma of the cervix we must have a classification because the results are manifestly different as the disease progresses. We have classified our cases into four groups: 1, young or beginning; 2, borderline; 3, inoperable; and 4, advanced or recurring.

Group I.—In young or what has been heretofore known as the operable stage of cancer of the cervix, we use radium in preference to other single agents, because the virulence or degree of malignancy encountered in even a very early case of cancer of the cervix is entirely out of proportion to the extent of the lesion—this, of course, by reason of the fact that the cervix is so intimately connected with the large lymphatic system. Ochsner in 1920 gave up operating on cervical cancer, and in 1921 he made the following statement (7): "For many years I used a cautery iron of large size because it would carry the heat far beyond the point of cauterization. During the last four years since Dr. Schmitz began to treat my cases of cancer of the uterus with radium, I have reduced the number of operations. This year I have not operated in a single case of carcinoma of the cervix." This radical view expressed by Ochsner and others caused many outstanding gynecologists to study their statistics carefully and employ radium instead of the knife. A noted gynecologist of Baltimore found that in 211 carefully selected cases of early cervical cancers operated in with full confidence that all the pathological tissue had been removed, only nineteen per cent. of the patients remained alive after a period of five years. At the recent meeting of the American Medical Association in St. Louis, Clark, of the University of Pennsylvania, reported twenty-two per cent. recoveries in six hundred cases of cancer of the cervix after a five year period, and, as Clark points out, in the distinctly operable type, radium should have, then, a higher percentage of cures than could possibly be had by a complete Wertheim operation, and this with no operative risk. The consensus of opinion at present is opposed to operation in socalled operable or beginning cancer of the cervix, but the use of radium tubes in the cervical canal is advocated, with, in suitable cases, implantation of radium needles in the involved tissues. Many are employing x rays as an adjunct treatment by raying over the pelvic and sacral region. In this plan of procedure I quite concur, and would urge surgeons always to give their patients the benefit of radium, instead of operation, as of more lasting good.

Group II.—This group of borderline cases is very disastrous for the surgeon, but, as the series of cases grows larger, it would seem to be ideal for radium. Unfortunately, few of our series of cases belong to this group. After the diagnosis has been made the patient is submitted to operation and it is only when the abdomen is opened that the extent of the growth can be ascertained. So good an authority as Clark recommends that these patients be treated with radium only.

Group III.—In this condition my experience has been that of Schmitz (8), who furnishes the following statistics: In cases in which operation was impossible certain patients were rayed and then operated upon, certain ones were cauterized and then rayed, and in certain instances radiation alone was used. In the latter group by far the best results were obtained—sixty-six per cent. of the patients alive, as opposed to thirty-one per cent. and twenty per cent. in the two previous groups, respectively. From these statistics it is evident that radium is the treatment of choice in this condition.

Group IV.—In this group of advanced and recurring cases we hope for nothing but palliative measures. However, the reports from a great many different observers show that in fifty per cent. there is a local healing of the growth, in sixty per cent. hemorrhage ceases, and in fifty per cent. the foul discharge is stopped. Pain is relieved, leucorrhea disappears, bladder irritation is relieved in fifty per cent. and rectal irritation in sixty per cent. "As a palliative," says Clark (9), "we have never obtained results with any other method that have even approached those secured by radium therapy."

In cancer of the fundus, however, our methods are entirely different. Always radiate before operation, and if, after waiting for six weeks to get the changes which occur in the tissues following this exposure, the chances are that a lesser operation only will be required, then immediately after the operation ray again. In old or terminal cancer we condemn radium as we condemn all other known agents, but radiumization may be used to clear up an unsightly slough, stop a foul discharge, check a continuous hemorrhage, and permit the patient's last days to be more comfortable. Like surgery, radium must be used with caution in these cases.

As regards the dose, we have obtained our best results from comparatively small amounts of radium over longer periods, the total amount given being from 1,500 to 2,000 milligram hours. This dose is repeated in six weeks if thought necessary, but we have found, in common with a great many others, that if two doses are without marked effect, there is little use trying it further. There is a certain percentage of cases in which the cancer is not retarded.

UTERINE FIBROIDS.

The effect of radium rays on uterine fibroids has been so far definitely established as to make radium a specific for certain types of this condition. However, certain care must be exercised in the choice of cases to be radiated. In patients under forty, where there is danger of producing an early menopause, much care as to size of dose must be used. In cases of very large fibroids and in those complicated by an inflammatory process, operation is indicated. Radium should not be employed in submucous or subserous fibroids where there is a suspicion of malignancy in the body of the uterus. The use of radium should be avoided where pelvic infection is present, as latent infection may be spurred to action by radium rays.

An enlightening and comprehensive paper on this subject has recently been published by Miller (10). He reports a series of 183 cases of myoma of the uterus and myopathic bleeding treated by radium. He does not particularly stress the results of radium treatment, as he considers that they are now well established, but he gives a fair estimate of the comparative value of radium and surgery in this condition. It may be stated that radium should always replace surgery in medium sized fibroids occurring in patients over forty and in others who are poor surgical risks, or who are opposed to surgery.

We have treated sixty cases of fibroids with practically constant results, viz., a cessation of abnormal bleeding, in many cases resulting in a menopause, a marked decrease in the size of the tumor, and a very marked improvement in the general well being. This is effected very often after one radiation but more complete results are secured by administering such subsequent treatment as seems to be indicated, at six weeks intervals. Smaller doses carry the advantage also of producing no systemic shock.

LEUCORRHEA.

The effect of radium on leucorrhea, which is often coexistent with a fibroid condition, is often remarkable. I have had several cases in which this discharge has quite cleared up under radium treatment. This result is corroborated by Clark (9), who states that in nineteen cases the patients who had previously had profuse leucorrhea were entirely relieved by this treatment. He considers these results as noteworthy in view of the fact that one might reasonably expect that changes produced in the endometrium and uterine bloodvessels might lead to a permanent and troublesome discharge. Curtis (11) reports that chronic leucorrhea of cervical origin is, in most instances, amenable to cure through dilatation or strictures and treatment with small doses of radium applied at infrequent intervals.

MENORRHAGIA AND METRORRHAGIA.

Most brilliant results are obtained in the use of radium in menorrhagia and metrorrhagia which are not associated with fibroids, for instance, in fibrosis which is not true arteriosclerosis or fibrosis, but is caused by a diminution and atrophy of the musculature, resulting in an increase of fibrous stroma, and where uterine compensation is lost with consequent bleeding. Paul de Grais, of Paris (12), states that, after carefully observing many cases under treatment, he is warranted in saying that when these conditions "are caused by hemorrhagic metritis, uterine sclerosis, or fibromata," radium is able to produce a cure. In his opinion the results obtained in these conditions are sufficient evidence to warrant radium being considered as a "true uterine styptic." Matas (3) reports seventy-eight cases of metrorrhagia treated with radium. Of these, sixty-four were fibromata and fourteen the socalled essential type of uterine hemorrhage. In metrorrhagia of the menopause, where granular metritis or other endometical pathology appears, he recommends radium when standard treatments fail.

A striking example of the effect of radium in essential bleeding is found in the case of Mrs. X., Case No. 2256, aged fifty-three, who for three years had had intermittent and profuse hemorrhages, which had left her in an exhausted condition. Examination disclosed a slight enlargement of the uterus and it was thought the menorrhagia was due to a diseased mucosa. In September, 1920. she had a seven days' flow, in October, two bleedings—each of which lasted seven days; in November one, lasting six days. In December, she was referred to me for radium treatment, and a ten milligram tube was applied for forty-eight hours. Similar radiations were given in January and February. In April the uterus had decreased to practically normal size and there had been no evidence of discharge since the first radiation.

As further examples of the value of radium in uterine hemorrhage, I cite the following cases:

CASE VIII (No. 2481).—Patient, aged twenty-seven, had had uterine hemorrhage since puberty. She had undergone several operations, curettages, etc., with no improvement. The bleedings often lasted a month. On examination a hardened cervix was found. Physical examination was negative. On June 3, 1921, six hundred milligram hours of radium were given *intra uteri*. One year later the patient reported that bleeding had entirely stopped since the last radiation.

LEUCOPLAKIA OF THE VULVA AND VAGINA.

Most encouraging results have been obtained in radium treatment of leucoplakia of the vulva and vagina. Conditions of long standing have shown remarkable improvement.

CASE XII (No. 818).—Patient, aged fifty-three, had had an irritable spot on the vulva for about fifteen years. It had been excised in 1914. She remained well for six months, when irritation recommenced, and she came for treatment in April, 1916, when the condition was one of leucoplakia of the vulva with thickening of the posterior vaginal wall. This was radiated at monthly intervals, and in August the diseased area was healed with no evidence of the growth.

The citation of these few cases gives a general idea of the scope and value of radium in the treatment of diseases of women. While radium seems simple of application, radium therapy requires long experience before it can be effectively employed with efficiency. Surgical acumen cannot be acquired in a few months or a year. Clear judgment in the use of radium demands ripe experience in all branches of medicine and surgery.

Cases IX, X, XI, XIII, XIV and references will appear in the author's reprints.

Editorial Articles

HEALTH AND WEALTH

Health is conceded, theoretically, to be man's most valued possession, but when it comes to actually paying for it, a different attitude is assumed. Trained health officials (the only state or city officials, by the way, who are specially trained for their duties) are, in this country, poorly paid. Not so in some other countries. The Medical Officer of Health of the City of Manchester, England, resigned a few months since. The city fathers, in a fit of economy, put forth an advertisement for a new officer to be paid a salary of seven thousand dollars. On the ground that this salary was not only inadequate for the responsibility attendant on the duties of the offices but also insufficient when compared with the salaries of other city officials (the town clerk receiving eleven thousand dollars) the *British Medical Journal* and *Lancet* refused to publish the advertisement. This was, of course, not only a protest of the journals but of the physicians whom they represent. As a result, the City Council took the hint and appointed a committee to confer in the matter with a committee representing the British Medical Association. The outcome of this conference was a compromise, the health officer to receive for the first two years seventy-five hundred dollars, for the succeeding two years, eighty-seven hundred and fifty dollars, and thereafter ten thousand dollars.

Had an inadequate salary been offered a health official in any city of the United States, we fear the profession would have found the matter of little concern. This is partly because politics, rather than preparation, enters into such appointments, but also due to the fact pointed out by an anonymous writer in the *Century,* who uses a caustic pen, but seems to know what he is writing about, that the average physician is antagonistic to, rather than favorably interested in, the local departments of health and their doings.

In England and in British States generally, health authorities are respected by the profession, are fairly well paid, and their tenure of office is being made secure, but, of course, health work there is much older than in this country. A committee of the American Public Health Association, which recently investigated salaries paid to health workers in this country, has recommended that the minimum salary for a full time state health officer should range from four thousand dollars to ten thousand dollars. Certainly when one considers the saving in cash alone which is made by reducing disease, these figures are none too high, and the profession should be interested to see that such medical officers of health are appointed as are worth the appointment and that they are paid as they deserve. Local medical societies might wield a stronger influence in this direction than they are wont to assume.

ASTROLOGY AND ASTRONOMY

Max Müller in his *Lecture on the Science of Language* tells us that "the astrologer was the counsellor of princes and generals, while the founder of modern astronomy died in poverty and despair." This circumstance brings to mind an apt analogy in the realm of psychopathology. Freud, the founder of the modern scientific school of psychopathology, the astronomer of the unconscious, did not share the fate of the man who founded astronomy, although many of his critics may have had this wish, yet he remained unrecognized, except for a few ardent followers, for a number of years. Fortunately he lived to see his theories accepted by many leading men of science throughout the world.

Aside from this we find today the old psychology intrenched and many "princes" of psychiatry cling to old methods which resemble the jargon classification of the good old astrological days, and many "generals" in our institutions of learning who wave the mystic wand of psychology and cover their tracks with a thin layer of data regarding the physiology of the special senses.

Truth will come to the surface and many more lessons could be learned from the past. On frequent occasions suppression and distortion have been used for the purposes of maintaining false doctrines. Abuse and ridicule were heaped on the heralds of new ideas. Time passed and the defenders of falsity were forgotten more rapidly than even their distorted dogmas. The younger generations were not so bound to ancestor worship as to prevent the rejection of such antiquated doctrines as astrology and alchemy. True, these cabalistic, ritual bearing monstrosities eventually gave birth to what we know as astronomy and chemistry today. We can now chart the heavens and measure chemical constituents with accuracy. So it will be one day when psychoanalysis comes into its own. We shall be able to explore the unconscious, as many pioneers are doing now, and replace the old psychoastrology which is being dished out to many credulous "princes and generals" of today.

HISTOLOGICAL AND HISTOCHEMICAL TECHNICS IN EXAMINATION OF THE LEUCOCYTES.

In preparations stained by eosinates the leucocytes, with few exceptions, present the same aspect. The nuclei are stained violet, the protoplasm a pale blue, while the basophile granulations are stained violet blue and the eosinophile granulations a faint pink. In the medium sized and large mononuclears a few violet granulations can be detected; these are azurophile granulations. By the vital stain the living leucocyte does not stain with the blue, contrary to what occurs in the dead leucocyte, but the fine protoplasmic granulations stain pale blue and they will be seen to be animated by Brownian movements. The leucocyte of pus is much more active than that of the blood and presents areas in which the granulations offer a peculiar intensity of the Brownian movements.

When a pus cell is to die, it does so progressively. The living leucocyte emits pseudopods; those of the blood leucocyte are almost always homogeneous and refringent, while the pseudopods of the pus cell are granular, frequently being pointed or rootshaped, and always are emitted in the direct proximity of an area of intense Brownian movement of the granulations. The granulations at the opposite pole of the cell are immobile or paretic.

Among the numerous factors influencing the movements of the leucocyte heat is preeminent and accelerates the rapidity of reptation. Starch possesses an intense tactism over leucocytes while charcoal is taken up by the leucocyte and drawn into its movements. A young leucocyte presents granulations almost all of which are in movement. Its nucleus is large and transparent, while an old leucocyte has only one focus of actively moving granulations and usually its nucleus has more than four lobes. The dead leucocyte has immobile granulations and its nucleus stains.

There are figured bodies comprised in the cytoplasm of leucocytes which in the young leucocytes may be iodophile but nevertheless are generally chromophile or sudanophile. The chromophile figured bodies are composed of lipoid substances, the sudanophiles by fatty substances of the neutral fat type and the more a leucocyte undergoes changes the greater will be its content in figured bodies. A constant relationship can be established between the increase of the chromophile bodies and a decrease of the leucocytic granulations, the latter be composed by a lipoprotean compound.

The presence of two series of oxidases can be detected in leucocytes, namely, a direct oxidase which oxidizes with the oxygen of the air or the ambient midst, and the indirect oxidase which takes oxygen from the peroxides and transports it to the bodies to be oxidized. The latter, which is the most important from the viewpoint of biology, is seated in the neutrophile and acidophile granulations. The leucocytes of the lymphatic series do not give rise to reactions indicating the presence of oxidases. The reaction of indirect oxidases persists in the leucocytic granulations if the leucocyte bursts, so that these ferments continue postmortem the diastasic action of the cell; hence the granulation becomes an elementary organism. The granular leucocyte is formed by the union of these elementary organisms whose nutrition and equilibrium it assures and when the leucocyte does not die in toto when it is destroyed its ferments survive. In other words there are two deaths, an anatomical and a functional.

THE POPULARIZATION OF SCIENTIFIC RESEARCH

Man has made progress in the past largely through the stimulation of untoward accidents, through the dogged obstinacy which makes the force which has knocked him down, work for, instead of against, him. Thus, the sharp stone which cut the foot of arboreal man on his descent from the tree tops became the arrow to supply him with a proteid diet and the knife to perform a thousand useful tasks, while the thorn which tore his flesh was utilized as the needle to fashion skins into a protective covering against the weather; the enemy, which destroyed the forest and burned his rude shelter, was transformed into the friend which cooked his food, warmed his scantily clothed body, frightened away his night prowling enemies and smelted out the metals for his weapons, tools and ornaments; the wind which sent great trees crashing to the ground was harnessed to waft man and his goods to distant shores; the brook which ruined the crops was put to grinding corn; the force which made the kettle boil over and scald the cook was made to carry burdens over land and sea and to relieve the body of man from arduous toil; the lightning which wrecked homes and blotted out human lives in one swift, flashing instant, became the servant to light and heat homes, to cook food, to afford transportation and to deliver messages to the uttermost parts of the globe; the explosive fluid which early man found seeping from the rocks, now tills the soil and the microorganism which once marred milkmaids now raises an effective wall against smallpox.

Paleolithic man was a shortlived animal compared with man of today. Death from fellow men and other animals came early, accidents and disease stalked ever on his trail, but out of the grief and suffering of those days arose the protective science of hygiene; the life of man has been lengthened and made more useful and secure. The accidents from which man suffered spurred his unyielding will to tame and subjugate enemies, and to make them his servants, just as the wolf has been transformed into man's best friend, the dog, and the savage bull into a source of draft power, of food and of clothing. The outgrowth of these stimuli is research; the plodding, painstaking, unrelenting seeking for means to overcome and conquer any force which has done a hurt to man.

The poisonous plants and minerals which made ill or killed the unwary or the timorous have been transformed into curative agents, while the very germs which slew thousands with lockjaw and diphtheria have been utilized as the producers of antitoxic sera. The disease which bereft England's queen of her Prince Consort and which up to a decade ago laid mighty armies low, has been relegated to the archaic sanitary past by antityphoid inoculation and conservancy, protective methods evolved by laboratory workers, epidemiologists and sanitary engineers. The labors of Laveran, of Manson, of Ross, of Carter, of Reed and many other sanitarians, entomologists and countless field workers have practically exterminated yellow fever, once the scourge of the Western Hemisphere, while malaria, which brought about the decadence of Greece and the fall of Rome, has been conquered.

These are but a few of the victories which have grown out of research, the seeking after truths for the enrichment of human knowledge, yet strangely enough, those who hold the public pursestrings are loath to set aside money for the conduct of laboratories and workshops for purely scientific investigations and to provide men of adequate ability to carry on research. It is difficult to make them understand that every addition to pure science, however abstract it may at first appear, sooner or later becomes a useful instrument in application, just as the discovery of the bacillus tulariensis was for several years of relatively small practical utility until the researches of Francis showed it to be the cause of deerfly fever. Vast sums are always readily forthcoming under the threat of an epidemic whereas a tithe expended in research will evolve methods of prophylaxis which will constitute a permanent insurance against the pestilence. Human nature is such that the man who actually takes the field against a disease receives far greater credence than the patient worker in the obscurity of the laboratory, yet it is the latter who provides the intellectual weapons for the former. Perhaps one reason for this is the encloistered way in which the research worker labors, and perhaps, the education of the general public which comes from publicity, the setting forth in the vulgar tongue the ideals, the accomplishments and the aspirations of scientific research, its popularization in other words, may be the means of correcting the attitude of the average person towards pure research.

VITAL STATISTICS IN NEW YORK STATE FOR 1918

The Annual Report for 1918 of the Division of Vital Statistics of the New York State Department of Health has just been issued. The report contains most interesting statistical data gathered since the establishment of the division. This is due to the two events having a fundamental bearing on the State's vital statistics, namely, the effect of participation in the War, and the great influenza epidemic.

The population of New York State, inclusive of New York City, was estimated as 10,681,667. The State furnished about 493,892 men to the armed forces of the Government. The deaths of soldiers, sailors and marines in the State, exclusive of New York City, comprised 1,469 or only 0.76 per cent. of the total deaths in the entire State, and only 1.54 per cent. of the total deaths exclusive of New York City (95,668). Birth registration records in 1918 show a total for the State of 242,704 births, 3,749 less than in 1917. The causes of this decline in the birth rate were the War, the influenza epidemic, and, in a less degree, the cessation of immigration. The total number of marriages registered was 94,107, less by 10,693 than the number in 1917. The latter year, however, showed an increase of 10,372 more than the average of the five years 1912-16. Both the increase in the number during 1917 and the decline in 1918 were doubtless the result of war conditions. The rate in 1918 was the lowest since 1908. The total number of deaths in the entire State of New York in 1918 from all causes was 193,787, including sailors, soldiers, and marines, of whom 1,469 died in the State's area exclusive of New York City. The rate was 18.1 to the one thousand population, the highest of any year since 1900, when it was the same. This was due to the influenza epidemic. From 1912 to 1917 inclusive the annual rates varied between 14.5 and 14.9. The number of deaths under one year of age for the entire State was 23,524, and the rate in proportion to each one thousand live births was ninety-seven, as compared with 22,473 deaths in 1917, and a rate of ninety-one. The increase was due to mortality from influenza pneumonia.

The following figures on some of the specific causes of deaths are of interest. In 1918, as compared with 1917, there occurred 38,191 more civilian deaths from all causes, 24,808 more from influenza, and 15,840 more from bronchial and lobar pneumonia combined. Declines in various causes, such as diarrhea and enteritis under two years of age, arteriosclerosis, cirrhosis of the liver, acute and chronic Bright's disease, accidents, and suicide slightly offset the heavy mortality from influenza pneumonia. Congenital debility and malformations comprised 33.6 per cent. of the total infant mortality of the state, yet this cause of death has declined in recent years. In the influenza pneumonia epidemic the highest peak was reached in October, in contrast to the normally high point of mortality in New York from this cause occurring in January, February and March. Influenza and pneumonia combined caused in 1918 a total of 61,015 deaths, as compared with 20,367 in 1917, an excess of 40,648 deaths. The rate per 100,000 population for influenza was 248.1, and for lobar pneumonia 224.2. The upward trend of pneumonia mortality, all forms combined, in recent years is evident from the following figures: the annual average of deaths from 1911-1915 was 16,449, with a rate per 100,000 population of 169.1; in 1916 there were 17,314 deaths, and a rate of 168.1; in 1917 there were 18,673 deaths and a rate of 178; in 1918 there were 34,513 deaths and a rate of 323.1. Bronchitis, the cause of 1,839 deaths in 1918, was apparently little affected by the influenza epidemic. In recent years it has declined slightly.

The report shows the following figures as to common communicable diseases. Typhoid fever caused in 1918 a total of 575 deaths, eighteen less than in the preceding year. Measles, scarlet fever, whooping cough, diphtheria, and cerebrospinal meningitis showed slight increases over 1917. Scarlet fever and diphtheria, however, have dclined slightly from the five year average of 1913-17. Infantile paralysis was the cause of only fifty-seven deaths in 1918, corresponding to a rate of only 0.5 to the one hundred thousand population. In 1916, when the serious epidemic occurred, the deaths numbered 3,351, with a rate of 32.5. Puerperal septicemia showed very little change from preceding years. Tuberculosis, all forms combined, caused 16,973 deaths in 1918, corresponding to a rate of 158.9 per 100,000 population. In 1917 the deaths numbered 16,632 and the rate was 158.5. Cancer, all forms combined, caused 9,876 deaths in 1918, the rate per 100,000 being 92.5. This cause, which had been increasing before 1915, has been practically stationary since that year. Diabetes, cerebral hemorrhage, arteriosclerosis, appendicitis, hernia, and intestinal obstruction showed little change in recent years as causes of mortality. Organic heart disease and endocarditis combined caused 23,456 deaths in 1918, representing a rate of 219.6 per 100,000 population. This cause was surpassed only by influenza and lobar pneumonia. Nephritis caused 11,315 deaths in 1918, corresponding to rate of 105.9 per 100,000 population, as compared with 13,136 in 1917 and a rate of 125.2. In spite of this sharp decline in 1918, however, this cause of death has varied little during a long course of years. Cirrhosis of the liver was the cause of 998 deaths as compared with 1,319 in 1917. Deaths from this cause have been declining rapidly in recent years. Old age was assigned as the cause of only 826 deaths in 1918, a rate of 7.7 to the one hundred thousand population. The report states that this title is to be regarded as an index of the accuracy of statements as to the cause of death of aged people, and as such indicates constant improvement in certification during recent years. In 1911-15 the annual average was 1,510, and the rate 15.5. Both show a rapid decrease since that time. Accidents from all external causes except suicide and homicide resulted in 8,448 deaths, the rate per 100,000 population being 79.1. Little change is evident over recent years, but a marked decline over 1917 is noted, when there were 9,274, with a rate of 88.4. Automobile accidents as cause of death show a most reprehensible increase. From 1911-15 the annual average was 486, with a rate of five to the one hundred thousand population; in 1916 the deaths numbered 820 with a rate of eight; in 1917 the deaths were 1,066 with a rate of 10.2, and in 1918 deaths numbered 1,216 with a rate of 11.4. These figures speak for themselves. Deaths from drowning show a slight decline. There were 1,302 deaths from suicide in 1918, with a rate of 12.2 to the one hundred thousand, the lowest since 1903, when it was twelve. Homicide caused 385 deaths in 1918, corresponding to a rate of 3.6 to the one hundred thousand. This rate was practically stationary during recent years up to 1918.

THE PRIMARY ADENITIS OF ZONA.

In a recent communication (*Bulletin de la Société Médicale des Hôpitaux,* 1921), Ramond and Lebel drew attention to the adenitis which constantly accompanies zona and which should be given the same place in the symptomatology of this affection as pain and the eruption. It clearly shows that the process is a distinctly infectious one and is susceptible, more so than pyrexia which is often wanting or overlooked, of distinguishing true zona from zosteriform eruptions.

The seat of the adenopathy is determined by the topography of the eruption and the enlarged lymph nodes are those whose afferent lymphatic vessels come from the cutaneous area involved. Therefore, in zona of the upper limb or in intercostal zona, the axilla should be explored, while in zona seated below the umbilicus the inguinal regions should be palpated. In ophthalmic zona the preauricular lymph node is enlarged; in occipitocervical zona the suboccipital glands are tumefied; in upper and lower maxillary zonas the submaxillary and suprahyoid lymph nodes are involved, while in supraclavicular zona the superficial cervical glands will be enlarged.

The lymphatic processes in zona is unilateral, it develops early before any cutaneous ulceration has occurred and it always faithfully accompanies the slightest eruption. Its characters are tumefaction and pain in one or several lymph nodes. The pain is never spontaneous and can only be elicited by palpation or pressure, hence when the glands are deep seated it is often overlooked. The tumefaction often may be visible when the involved lymph nodes are superficially situated, otherwise palpation must be resorted to in order to diagnose them. In most instances a single lymph node is involved but sometimes several glands belonging to a group will be enlarged.

The adenitis of zona always undergoes spontaneous resolution, disappears at about the end of a week and will have usually subsided when the more or less ulcerated vesicles appear to be the seat of a secondary infection. Suppuration of the glands never ensues nor does chronic adenitis follow. On the other hand, one must distinguish this primary adenitis from the acute adenitides following infection of the zona vesicles or those of herpes. The latter develop late in the process and are uncommon, while in uncomplicated herpes there is no adenitis.

The great interest of the primary adenitis described by Ramond and Lebel is that in doubtful cases the diagnosis of zona can be affirmed, hence it should be regarded as a valuable diagnostic element of true zona.

NEW JOURNAL OF ORAL MEDICINE.

The American Academy of Applied Dental Science has recently begun publication of an official organ under the title of *The Journal of Oralogy.* The first issue was for June, and the magazine is a quarterly. Dr. Alfred Asgis, of this city, is editor in chief. It is stated that the aim of the journal is "to present to the dental and medical practitioner, as well as the layman, articles by recognized authorities on new and vital viewpoints in the healing professions." Among contributors to the first number are Henry A. Cotton, John L. Kelly, Joseph Novitzky, Rudolph M. Binder, Bertram Ball, and Theodore Blum.

News Items.

American Academy of Applied Dental Science.—The fourth annual meeting of this organization will be held at Miami, Fla., January 8 to 11, 1923. This short course in oralogy and dentistry which includes papers, clinics, and educational classes, is free. For further information address the corresponding secretary, Dr. H. L. Madison, Burlington, Ia.

Reduction in Infant Mortality.—The American Child Hygiene Association, in its statistical report of infant mortality for 1921, demonstrates that there has been a remarkable reduction in infant mortality throughout the country. The rates for the 573 cities covered in the report are: 98.6 in 1917; 106.7 in 1918; 91.4 in 1919; 91.5 in 1920; 77.9 in 1921.

New York Needs Private Hospitals.—In a statement issued recently on behalf of the United Hospital Fund, Dr. Royal S. Copeland, Commissioner of Health, urged that the privately owned hospitals should receive public support. Inasmuch as there were not nearly enough beds in the city institutions to take care of the sick in New York, private hospitals were a vital necessity.

American Dietetic Association.—The fifth annual meeting of this association will be held in the New Willard Hotel, Washington, D. C., October 16th, 17th, and 18th. The recent development in dietetics and the administrative and other problems of the dietitians will be discussed. An interesting feature of the convention will be an exhibit of equipment, charts, and other illustrative material.

Higher Death Rate in 1922.—The Department of Commerce announces that provisional mortality figures compiled by the Bureau of the Census for the first quarter of 1922 indicate higher death rates than for the corresponding quarter of 1921. For the states compared the death rate for the first quarter was 13.7 in 1922 against 12.6 for the first quarter of 1921. The highest mortality rate for the quarter is shown for the District of Columbia, 17.6, and the lowest for Wyoming, 9.6. These early figures forecast for the year 1922 a higher rate for the death registration area than the record low rate, 11.7, for the year 1921.

National Medical Association.—The annual meeting of this society of colored physicians was held in Washington, D. C., during the week of August 28th. The program included a public meeting at the Smithsonian Institution, under the direction of Dr. Roscoe C. Brown, of the United States Public Health Service. In a discussion of the venereal disease problem it was recommended that a health certificate be required before marriage. The following officers were elected: President, Dr. J. Edward Perry, of Kansas City, Mo.; president-elect, Dr. John V. Plummer, of Raleigh, N. C.; first vice-president, Dr. H. R. Smith, of Chicago; second vice-president, Dr. L. Marion Lawrence, of Philadelphia; third vice-president, Dr. C. E. Le Branch, of New Orleans; general secretary, Dr. W. G. Lawrence, of Orange, N. J.; assistant secretary, Dr. G. H. Francis, of Norfolk, Va. Next year's meeting will be held in St. Louis, Mo., in August.

Research Assistant in Child Hygiene.—The United States Civil Service Commission announces an examination for research assistant in child hygiene to fill vacancies in the children's bureau, Department of Labor, at $1,600 to $2,000 a year. Applicants must have been graduated from a college or university of recognized standing, and their education must have included courses in anatomy, physiology, hygiene and the physical and mental testing of children. Applications will be received up to October 10th.

Arizona State Medical Association.—At its annual meeting, held in Prescott, June 14th to 16th, officers were elected for the coming year as follows: Dr. Harry T. Southworth, of Prescott, president; Dr. Charles A. Thomas, of Tucson, Dr. Roderick D. Kennedy, of Globe, and Dr. Arthur C. Carlson, of Jerome, vice-presidents; Dr. Alvin T. Kirmse, of Globe, was reelected treasurer, and Dr. Delamere Harbridge, of Phoenix, reelected secretary. A number of resolutions were passed among which was one opposing the Sheppard-Towner bill and all state medicine. The formation of a woman's auxiliary to the state association was also planned.

Medical Association of Maine.—The annual meeting of the Maine Medical Association was held at Portland, June 26th to 28th. Dr. Langdon T. Snipe, of Bath, was elected president for the coming year, and other officers were elected as follows: President-elect, Dr. Charles A. Moulton, of Hartland; first vice-president, Dr. John W. Nichols, of Farmington; second vice-president, Dr. Walter N. Miner, of Calais, and secretary-treasurer, Dr. Bertram L. Bryant, of Bangor. The meeting was addressed by Dr. Olin West, of Chicago, traveling secretary of the American Medical Association, and by Dr. Channing Frothingham of Boston. The meeting for next year is scheduled for June 12th to 14th, at Houlton.

Women's Clubs and Infant Death Rate Reduction.—The new Division of Maternity, Infancy, and Child Hygiene, recently organized by the State Department of Health under the new New York State Maternity law, has appealed for cooperation to all the women's organizations of the state in the new campaign to reduce the infant death rate. The organizations called upon for assistance include the State Federation of Women's Clubs, Women's Christian Temperance Union, American Association of University Women, Daughters of the American Revolution, Home Bureau, State League of Women Voters, Council of Jewish Women, Parent-Teacher Association, Catholic Women's Welfare Organization, and Congress of Mothers. Three methods of cooperation are suggested by the department in its appeal to women's organizations: 1. The formation of Mothers' Health Clubs, with the object of teaching all mothers how to keep themselves and their children well and how to bring healthy children into the world. 2. The provision of mothers' helpers who will go into homes and help with the household duties at the time of confinement. 3. The formation of mother and child hygiene study classes with the object of informing the members of the club regarding existing conditions in the community, and of promoting any improvements that may be needed.

New York and New England Association of Railway Surgeons.—The thirty-second annual session of this association will be held in the Colonial Room, Hotel McAlpin, New York, on Saturday, October 28, 1922, under the presidency of Dr. Donald Guthrie, of Sayre, Pa. An interesting program is being arranged, and plans are under way to make this the biggest and most successful session ever held by this association. Dr. George Chaffee is corresponding secretary.

Personal.—Dr. Delos J. Bristol, of Harvard University, has been appointed head of the department of public health and preventive medicine recently created at the University of Minnesota.

Dr. Israel J. Biskind, formerly of Cleveland, Ohio, has been appointed consulting surgeon to the Government of Palestine. Dr. Biskind is personal physician to Sir Herbert Samuel, High Commissioner of Palestine.

Sir Charles Scott Sherrington, M. D., president of the Royal Society and Waynflete Professor of Physiology at Oxford University, will attend the formal opening of the new biological building of McGill University, Montreal, in October.

Dr. Henry Adsitt, of Buffalo, has been appointed chairman of the National Hospitalization Committee of the Disabled American War Veterans of the World War.

Dr. Edward P. Richardson has been appointed chief of the full time surgical service, at the Massachusetts General Hospital, which the trustees have authorized to commence on September 1st.

Dr. Charles H. Frazier, of Philadelphia, has been appointed John Rhea Barton Professor of Surgery in the University of Pennsylvania, succeeding Dr. John B. Deaver, who resigned recently.

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Died.

Clarke.—In Atlanta, Georgia, on Thursday, August 24th, Dr. Lee Benjamin Clarke, aged fifty-four years.

Craig.—At Port Deposit, Maryland, on Saturday, September 2nd, Dr. Alexander Richter Craig, of Chicago, aged fifty-four years.

Dunham.—In Woking, England, on Tuesday, September 5th, Dr. Carroll Dunham, of Hillside, Irvington, New York, aged sixty-five years.

Ernst.—In Boston, on Thursday, September 7th, Dr. Harold C. Ernst, aged sixty-six years.

Halsted.—In Baltimore, Maryland, on Thursday, September 7th, Dr. William S. Halsted, aged seventy years.

Juettner.—In Cincinnati, Ohio, on Friday, August 25th, Dr. Otto Juettner, aged fifty-seven years.

Meyersburg.—In Brooklyn, New York, on Saturday, August 19th, Dr. Adolphus G. Meyersburg, aged fifty-four years.

Neiman.—In Brooklyn, New York, on Sunday, August 27th, Dr. Levi Allen Neiman, aged sixty years.

Rautenberg.—In Staten Island, New York, on Monday, August 21st, Dr. Godfrey W. Rautenberg, aged sixty-three years.

Ross.—In Brooklyn, New York, on Tuesday, August 15th, Dr. Walter Howard Ross, aged fifty-two years.

Sutphen.—In Newark, New Jersey, on Thursday, August 24th, Dr. Theron Yeoman Sutphen, aged seventy-two years.

Spitzka.—In Mount Vernon, New York, on Monday, September 4th, Dr. Edward Anthony Spitzka, aged forty-six years.

LONDON LETTER.

(*From Our Own Correspondent.*)

LONDON, *August 15, 1922.*

PROFESSIONAL SECRECY.

The nineteenth meeting of the British Medical Association opened in Glasgow on July 21st. The first few days were taken up with the annual representative meeting and some questions of the first moment were discussed. Professional secrecy was keenly debated. The following recommendation was moved by Dr. Langdon Down: That it be the policy of the association to support in every way possible any member of the British Medical Association within the United Kingdom who, in the opinion of the council on the Central Ethical Committee, acting on behalf of the council after due consideration of the circumstances, is deemed to have been justified in refusing to disclose any information he may have obtained in the exercise of his professional duties. This resolution was substituted for last year's resolution at Newcastle which read: That the association use all its power to support a member of the association who refuses to divulge without the patient's consent information obtained in the exercise of his professional duties except where it is already provided by Act of Parliament that he must do so. It was now considered that this resolution, interpreted literally, bound the association to do too much for its members who clashed with judges on account of their refusal to disclose secrets intrusted to them in their medical capacity by patients. Dr. Langdon Down intimated that the support which the council proposed to give to any doctor whose refusal to tell was deemed justified would take the following form: Arrangements to be made by the local division of the association for the carrying on of such doctor's practice; the organization of public opinion through the press, Houses of Parliament, etc.; legal advice to be provided by the association.

The discussion which ensued was somewhat heated, but ultimately Dr. Langdon Down's motion was carried almost unanimously. However, the fact was recognized that the medical witness was insufficiently protected and the adoption of the following recommendation was moved and passed: That as in the opinion of this meeting it is an essential principle of medical conduct that information obtained in connection with the treatment of patients should not be divulged without the consent of the patient concerned, the annual Representative Meeting, 1922, express the opinion: That the proper preservation of professional secrecy necessitates a measure of special consideration being recognized for medical witnesses in courts of law above and beyond what is accorded to the ordinary witness.

ETIOLOGY OF RICKETS.

Perhaps the most interesting discussion of the meeting was that on the etiology of rickets. Dr. Leonard Findlay, of Glasgow, opened the discussion. He first dealt with the dietetic hypothesis and pointed out that the observations of Hutchinson at Nasik, India, were against the diet hypothesis. He found that rickets only occurred among the well fed children of the rich Brahmins who were kept in dark quarters, while the poorly fed Hindoo child who lived an open air life never had rickets. Dr. Findlay also referred to the incidence of keratomalacia among children who were fed on diets deficient in fat, although rickets did not develop. In his opinion confinement played a great part, and the institution of massage helped to establish a rapid cure without any other changes in the conditions being made. He also thought that sunlight might have a good action by producing movements of the limbs even though it did not have a specific effect. He urged the medical profession to rid their minds of the obsession that rickets must necessarily be a deficiency disease, due to the absence of some factor. He preferred to believe that there must be some specific virus which was responsible for the change. Professor Edward Mellanby could not find any evidence for the hypothesis of Dr. Leonard Findlay that some specific virus was the prime cause and asked him to produce some evidence in its favor. He suggested that the following statements would cover most of the conditions where diet and sunlight interact: 1. That when a child was well fed the presence or absence of sunlight made no difference to its health in so far as rickets was concerned. 2. That in the case of a child fed on a mediocre, borderline diet, exposure of the skin to sunlight would probably prevent rickets. 3. That in the case of badly fed children, that is, when the diet contained much cereal and a deficiency of fat soluble vitamine and calcium, sunlight would not prevent rickets, but might ameliorate the symptoms to some extent. He regarded sunlight and exercise to be of secondary importance to diet.

Dr. Robert Hutchinson, of London, speaking from the purely clinical point of view, thought that the dietetic factor could not be dismissed as Dr. Findlay had suggested, since it was possible to cure almost any case by a change of diet. Von Pirquet's views on the possibility of substituting carbohydrates for fats were remarkable, for no diet was more likely to produce rickets than one of sweet condensed milk. Although hygiene played a part it could not be the only factor and a change of diet by itself was sufficient to alter the whole course of the disease. He could see no evidence in favor of Dr. Findlay's hypothesis of a specific virus.

Professor Noel Paton, of Glasgow, criticised Mellanby's experiments and conclusion and thought also that the Medical Research Council had blundered in classing butter as of equal value with codliver oil in the treatment of rickets. He had not found evidence of the specific virus of rickets, but his results did not coincide with Mellanby's.

Professor V. Korenchevski thought that the factors playing a great part in the origin of the disease were: 1, the deficiency of A vitamine or, at any rate, an organic factor closely connected with it; 2, the amount of calcium and phosphorus; 3, confinement; and 4, insufficiency of sunlight.

Dr. Sim Wallace said that as a result of the inspection of teeth in the schools it appeared that caries was not a deficiency disease, but rather a luxury disease, as it was common among the well fed children who had excess of easily fermentable food which stagnated among the teeth.

Dr. Eric Pritchard, of London, did not take part in the discussion.

BALKAN LETTER.

(*From Our Own Correspondent.*)

TRANSYLVANIA, RUMANIA.

ANTIRABIC TREATMENT IN BUDAPEST.

From the report of the Budapest Pasteur Institute recently issued, it appears that in the last ten years 3,942 patients have received antirabic treatment. Nearly half of these had been bitten by animals proved either by laboratory experiments or other conclusive tests to have been rabid. Out of the total number but twenty-seven deaths occurred, giving a mortality of 0.7 per cent. Figures such as these show that this most dreaded of all diseases has been robbed of its terrors. It is well known, says the report, that bites received on exposed parts are much more likely to cause dangerous results than those occurring on parts covered with clothes, since in the latter case but little of the saliva of the animal reaches the wound. Turning, then, to the returns as to the sites of the lesions, we find that 497 have occurred on the head and face, and 2,008 on the hands and wrists. The remainder occurred on parts probably protected by clothes. It can be seen from the report that about three fifths of the wounds treated were of most menacing character. The report gives also an interesting table of the animals by which the bites had been inflicted. As one would expect, dogs are by far the most numerous in the list, but we find other domestic animals implicated—cats, horses, cows, mules, pigs, sheep. Among wild animals are skunks, wolves, foxes. Curiously enough no less than thirty-one patients were bitten by human beings, themselves victims of hydrophobia.

LONGEVITY IN BULGARIA.

On looking over the return for the last year recently issued, one is struck with the great number of cases recorded of deaths occurring at advanced ages. In the Trnovo district a death has been registered at the age of 114 years, and at Rustesuk one at the age of 113, which age the registrar believes to be accurate. In addition to these no less than thirteen other centenarians are reported to have died during the past year. Curiously, of those who just failed to reach the even hundred, the number is somewhat less, as only nine deaths are drawn attention to as occurring between ninety and one hundred. When we come to octogenarians the numbers rapidly increase, as notes are made of about thirty deaths between eighty and ninety, and there are probably many more of which the registrars do not think it worth while to make special mention. A comparison of the mortality among old people with that among the total population also gives some interesting facts. For example, out of one hundred deaths in the Stevlievo district, thirteen occurred at ages exceeding seventy-five years. In the Stilistra district the total number of deaths was forty-two, of which nineteen were at ages varying from seventy-five to ninety. Out of twenty deaths in the tillipopoly district, seven were at ages over eighty. These instances are all taken from rural areas, where life may reasonably be expected to be long; but looking at the whole of Bulgaria, town and country, it would appear that about half the total number of deaths occur after the age of fifty-five.

DEATH UNDER ETHER.

At Cluj, Transylvania, an inquest was conducted by the coroner on the body of a single woman. The evidence showed that the woman had undergone an operation several months ago for a sarcoma of the neck. She consented to another operation, and in both instances ether was administered. There were no signs of fainting at the first operation, and at the last operation it took ten minutes to get her under the influence of the ether. The operating surgeon stated that his attention was drawn to the woman's condition as he was about to stitch the wound up. Artificial respiration was resorted to, but without avail. The cause of death was sudden failure of the heart's action due to ether. The jury returned a verdict of misadventure.

INDUSTRIAL DISEASES DUE TO POISON.

A series of lectures on Public Health will be given in Budapest, by professors of the university. The first lecture was given a few days ago. The subject was industrial diseases due to certain fumes or gases, and the lecturer dealt principally with those caused by sulphuretted hydrogen, carbon monoxide, bisulphide of carbon, and phosphorus. Dealing with phosphorus poisoning in match factories, he pointed out that after making extensive inquiries he found that absolute immunity from that poisoning could not be guaranteed so long as white phosphorus was used. Such poisoning has now considerably diminished, and match making has ceased to be a dangerous trade by the substitution of several less harmful materials for white phosphorus. Speaking of poisoning by sulphuretted hydrogen, he said he did not think members of the medical profession were sufficiently alive to the danger of inhaling it, and instanced several cases in which death had resulted almost instantaneously from such inhalation.

THE PRICE OF DRUGS IN HUNGARY.

Since the first day of the war the price of drugs has continually risen, and although the Board of Health has issued several orders on the subject complaints of infringements of the law are continually made. The druggists state in their defence that owing to bad postal communication they are obliged to travel abroad in order to purchase supplies. In peace time they simply wired to Vienna, Berlin, or Paris for drugs and within two or three days they had them. It is quite different now. A letter to Germany is sometimes eight days or more on the way; goods can only be imported by a person who accompanies the goodswagon. Freight and duties are very expensive; even if the druggist can buy cheaply, a poor man who is not a member of some sick club cannot afford to pay the fancy prices of drugs. Several druggists have been fined for these high prices, but until more normal traffic conditions prevail they cannot sell at lower figures. American medicines, which were very highly esteemed before the war, can no longer be procured here, again because of the rate of exchange. Prohibitive prices force doctors to use inferior preparations, and even these are very costly. Several enterprising druggists have attempted to manufacture drugs, but the lack of good machinery, raw materials, and skilled staff resulted in inferior products.

Book Reviews

FRACTURES.

On Modern Methods of Treating Fractures. Including the Jacksonian Prize Essay on Bone Grafting. By **Ernest W. Hey Groves**, M. S., M. D., B. Sc. (Lond.), F. R. C. S. (Eng.), Surgeon to the Bristol General Hospital; Consulting Surgeon to the Cassham Hospital. Second Edition. New York: William Wood & Co., 1922.

Like all new works and new editions this book contains a great mass of information derived from the war experience. In gleaning the knowledge here embodied the author had the advantage of close association with Sir Robert Jones and his pupils. The author believes that the study of fractures, their mode of production, and their management, should constitute a specialty as distinct as those dealing with diseases of the eye, throat, or other parts of the human frame, and "until fractures cease to be the mere encumbrances of general surgical wards, no great progress can be made in knowledge, treatment, or teaching." The book is profusely illustrated in black and colors, and we may add, appropriately illustrated, not one being superfluous or introduced merely for effect or as padding. Groves has definite opinions of his own regarding the treatment of fractures and he does not hesitate to express them, but he has also been hospitable to the views of others and describes very fully and satisfactorily the various methods advocated by other surgical authorities. The book should find a place in the library of every man in general surgical practice or whose field of activity is more or less remote from medical centres, for it will on occasion be found a friend in need.

MOTHERHOOD.

The Threshold of Motherhood. A Handbook for the Pregnant Woman. By **R. Douglas Howat**, L. R. C. P. (Edin.), L. R. C. S. (Edin.), L. R. F. P. (Glas.). Glasgow: Maclehose, Jackson & Co., 1922. Pp. 49.

This is an extremely useful little book in which a large amount of valuable information concerning the antenatal and postnatal care of the mother is compressed into forty-nine pages. The book is intended to provide instruction for the pregnant woman herself, and the language and wording is in keeping with this purpose, being at one and the same time expressive, concise, and clear. Technical terms are almost wholly tabooed. The subject is considered from all essential points of view. Sexual physiology is surveyed briefly. An obstetrical table is given by means of which an approximately accurate calculation may be made by the pregnant woman of the date of her confinement. The care of pregnancy is dealt with at some length. The individual symptoms of pregnancy are discussed. The layette and other necessities are described as well as the preparations for the confinement. The confinement itself, the symptoms of its onset, and the technic of delivery, in so far as it concerns the woman, are entered into and the chapter ends with an earnest advocacy of chloroform anesthesia during the period of labor. The last chapter discusses the measures to be taken with mother and infant immediately after delivery. The book supplies a need felt among the indigent and cosmopolitan inhabitants of New York and some other American cities, as much as anywhere in the socalled civilized world. As the author says, the whole subject of midwifery may be summed up in two words, cleanliness and commonsense; and these should be the watchwords of every expectant mother. This small volume is an epitome of midwifery from the woman's outlook and may be commended as such.

OPHTHALMOLOGY.

Manual of the Diseases of the Eye. For Students and General Practitioners. By **Charles H. May**, M. D., Director and Visiting Surgeon, Eye Service, Bellevue Hospital; Attending Ophthalmic Surgeon to Mt. Sinai Hospital. Tenth Edition, Revised. With Three Hundred and Seventy-seven Original Illustrations, Including Twenty-two Plates, with Seventy-one Colored Pictures. New York: William Wood & Co., 1922.

May's excellent guide has served the medical students of nearly a generation. Its successive editions have been characterized by accuracy, completeness, and progressiveness in practical teaching. There is little to be said of a work so well known, which has been translated into innumerable foreign languages, and is as standard in our times as Nettleship and Gray were in theirs. It is the smallest of the best and the best of the smallest.

RADIOTHERAPY.

X Ray Dosage in Treatment and Radiography. By **William Daniel Witherbee**, M. D., and **John Remer**, M. D. New York: The Macmillan Company, 1922.

A monograph covering the more technical details in x ray therapy of the skin. Several pages are devoted to the subject of irradiation of tonsils and adenoids, Hodgkin's disease, and fibromyomata; and a word, too, about leucemia, x ray dermatitis and its radiographic aspect are other items covered. The material throughout is mostly a compilation of facts previously published by the authors in current medical publications. Compactness and simplicity recommend this hand book to radiotherapists.

CANCER.

Cancer of the Breast and Its Treatment. By **W. Sampson Handley**, M. S., M. D. (Lond.), F. R. C. S. (Eng.), Hunterian Professor of Surgery and Pathology in the Royal College of Surgeons of England; Surgeon to the Middlesex Hospital and to its Cancer Charity, and Lecturer in its Medical School. Second Edition. New York: Paul B. Hoeber, 1922.

The author aims to place the surgical treatment of cancer on a more scientific foundation by firmly establishing the permeation theory of its dissemination. The book also includes the radiological treatment of cancer, recurrence of the growth and its operative treatment, Paget's disease of the nipple, lymphangioplasty and an investigation of trauma as an etiological factor in carcinoma. The chapter on the natural processes of repair in carcinoma is important in view of the author's claims and has been entirely rewritten. In recent years cancer research has progressed in two directions: the experimental study of cancer and the systematic microscopic study of extensive areas in contrast to the older methods of studying the cancerous areas themselves. The limitations of the older method have been pretty nearly reached. The search for the pathogenesis of cancer is much more difficult than the therapeutic problem, to say the least.

The author maintains that carcinoma spreads centrifugally in all directions by permeation of the lymphatic plexuses; that curative and reparative processes inadequate for cure are a normal part of the cancerous process; that the inflammatory process and fibrous tissue formation are the organism's main defense against carcinoma, but that they develop only when the cancer cell exerts pressure on its surroundings, or from chemical irritation through its degeneration; that cancerous invasion of the serous cavities is critically important in the disseminative process, and finally that the embolic theory of dissemination is only true for exceptional cases. The fact that the Royal College of Surgeons has awarded the author the Walker Prize for Cancer Research in 1915 testifies to the widespread acceptance of his views.

A novel feature in the matter of illustrations is the panoramic method of showing the microscopic growing edge of cancer and its method of permeating the fascia via the lymphatics with infiltrations; the histologic picture of the permeation of the lymphatics is also shown.

HEMOLYTIC ICTERUS.

Der chronische hereditäre hämolytische Ikterus (Konstitutionelle Hypersplenie). Eine nosographische Studie. Von E. Meulengracht, Privatdozent, Kopenhagen. Leipzig: Dr. Werner Klinkhardt Verlag, 1922. Pp. viii-226.

This exhaustive monograph is the result of the direct clinical observation of fifty cases of chronic hereditary hemolytic icterus collected in Denmark and compared with other pathological conditions found in man. The material selected consisted of thirty-four patients personally, carefully, regularly and repeatedly examined, of which twelve were operated upon. They were classified as definitely hereditary and isolated cases.

The conclusions drawn are the following: The striking feature of the pathogenesis of this disease is the markedly increased destruction of blood, or in other words the markedly increased and accelerated blood change, due to either a reduced period of life of the red blood cells (chiefly disease of the bone marrow) or a hyperfunction of the hemolytic organs (chiefly splenic disease—an active hypersplenia). The author believes that this disease is a disturbance of balance in the normal blood changes, produced by a primary and active hypersplenia; the reduction of the osmotic resistance and the microcytes are secondary regenerative phenomena and elements of a type of regeneration characteristic of hypersplenia. The enlarged spleen is the result of an excessive hyperemia of the splenic pulp, with hyperactivity of the spleen and the resulting acceleration of its hemolytic function. The erythropoietic system in the bone marrow also shows hyperactivity. The other changes, as those of the Kupffer cells, hemosiderosis, pleiochrome bile, gallstones, changes in and around the gallbladder and gouty deposits are not constant and of secondary significance.

This disease is a dominant factor in heredity. Its etiology is truly heredity (heredofamiliar) and must be attributed to changes in the anlage of the germinal cells, the actual cause being unknown. It is cured clinically and permanently by splenectomy, except for microcytosis and the reduced resistance of the erythrocytes, both of which symptoms persist but are markedly diminished by the splenectomy. The isolated cases must be considered as the originators of the manifest hereditary cases. The cases described as hemolytic icterus present a nosologic entity; some of the cases seem to include certain conditions of known or relatively unknown etiology, such as pernicious anemia, anemia of pregnancy, certain cases of Banti's disease, etc., while others may be grouped as primary or cryptogenetic hemolytic icterus.

The histories are appended and are grouped into true hereditary cases and isolated cases, the latter being classified as nonoperated, operated, and acquired hemolytic icterus. The bibliography is extensive.

MAYO CLINIC PAPERS.

Collected Papers of The Mayo Clinic, Rochester, Minnesota. Edited by Mrs. M. H. Mellish. Volume XIII, 1921. Published May, 1922. Philadelphia and London: W. B. Saunders Company, 1922. Pp. xiii-1318.

This volume, consisting of 117 papers published in 1921 by seventy-six members of the Mayo Clinic staff, appears as the latest contribution to current medical literature having permanent value. There can be no doubt of the real usefulness of these collected papers. While there is no definite contiguity in subjects that one would expect to find in a textbook, these special articles written by experts in their respective field exercise a striking appeal to the physician or surgeon who would know the last word from authoritative sources.

The topics under review are so variegated and yet of such practical importance, that it is difficult to select any of them for particular comment. As is usual with this series, the illustrations, nearly four hundred in number, are well done, and the printing is of the usual Saunders quality. The volume is a valuable addition to any medical library.

OBSTETRICAL NURSING.

Obstetrics for Nurses. By Joseph B. De Lee, A. M., M. D., Professor of Obstetrics at the Northwestern University Medical School; Obstetrician to the Chicago Lying-in Hospital and Dispensary. Sixth Edition, Entirely Reset. Philadelphia and London: W. B. Saunders Company, 1922. Pp. 525.

This new edition treats the subject of obstetrical nursing in the most thorough and up to date manner. As maternity hospitals are becoming popular with the public, the methods of the Chicago Lying-In Hospital are described in detail. An important feature of this little book is the forcible manner in which the nurse is taught her duties to the patient and also the procedures for preparing aseptic and proper surroundings from the simplest materials for deliveries outside of the hospital. The nurse's duty as a missionary for the best obstetrical practice is accentuated.

In addition to the elementary subjects of anatomy and the physiology of the pregnant woman, the proper infant's layette is described. The various ways in which the nurse can and should be of assistance to the physician are detailed. The most approved technic of labor and the nursing care of women and their babies are taken up. Nothing, in short, is omitted that would aid in producing comfort and well being for both mother and child. The operating room technic is fully described. The chapter on infant feeding is very good. The illustrations and their legends are accurate and instructive. The appendix includes such topics as the work of the visiting nurse, home nursing, the methods of sterilization, dressings, solutions, venereal diseases, dietary recipes and methods of feeding. A glossary adds much to the value of the book.

Too much cannot be said about the value of this book to the nurse: it is the final word in obstetrical nursing, being intensely practical, precise, and up to the minute.

EXTRAPLEURAL THORACOPLASTY.

La Thoracoplastie extrapleurale. Dans le traitement de la tuberculose pulmonaire. Par le Docteur JEAN MADINIER, Interne des Hôpitaux de Lyon. Preface du Docteur DUMAREST (d' Hauteville). Paris: Masson et Cie, Editeurs, 1922.

It is the purpose of this monograph to popularize in France extrapleural thoracoplasty in the treatment of tuberculosis. Except for a few case reports, it contains little original matter. It provides, however, a fairly adequate summary of the literature. The author himself states that he has drawn freely on Sauerbruch's masterly publication. It is doubly unfortunate, therefore, that he persistently misspells his name. The author recommends the employment of this operation in the localized indolent fibroid types of phthisis. These are the patients, however, who tend to do well under any form of treatment, so the results attained by surgery are not always convincing. The bibliography is rather scanty.

FROM THE HUNGARIAN.

The Old House. By CECILE TORMAY. Translated from the Hungarian by E. TORDAY. New York: Robert M. McBride & Co., 1922. Pp. 287.

Like a vein of precious metal we follow the Ulwing family through four generations. Alloys crop up, failures to fuse in the white heat of experience, and like the family, sound to the heart, is the old house. It is born, grows, lives, and dies, the symbol of the family's greatness.

The city of Pest springs up under Christopher Ulwing's master fingers. His brother, already clinging to the past, is swallowed up by change. The life of the growing city, though, reverts to the past also for its dreams, and the brother becomes the hero, while Christopher, alive and creating, ever forging ahead, is forgotten. On his death the dynasty passes to his son and grandson. But the spirit of the master builder pervades the old house. John Hubert, the son, can only live by its remembered guidance. Nothing is changed, the business creaks along in the rut of farthest advance to which it had been pushed in Christopher's time.

In the atmosphere of the old house two motherless children grow up. The heavy past stifles Christopher. To Anne it is the beautiful fairyland of her old fashioned uncle. Christopher flings everything away, the elements of his being wracked and infusible. The old house has passed its zenith. It totters under Christopher's erratic steps. And to Anne, married to a man who dreams only of his own ancestral home, comes ruin, understanding, love, and loss. The pure gold of the Ulwings rings true to the last in her. Like her grandfather she at last faces the future, torn forcibly from the past. She realizes herself; projects herself into the life of her sons.

Rarely have we had the delight of reading so powerful a book. The beauty of old time Budapest, the haunting theme of swelling life and slow decline, the reiterated chant of generations, make this first novel of the Hungarian writer a work of art. She has understood how the currents of life and time flow, moulding our small individual lives. Through the clear crystal of the translation we find what we have long sought—reality!

LIFE IN SCANDINAVIA.

The Outcast. By SELMA LAGERLÖF. Translated from the Swedish by W. WORSTER, M. A. Garden City, New York, and Toronto: Doubleday, Page & Co., 1922. Pp. vi-297.

A strange, lovely story of the counterbalance between life and death, and the sufferings of a man who finally swings the scale to life. The mystery of Sven Elverssen, the outcast in his own home, is the shadow play of all human motives, and unconscious beliefs. A countryside's superstitions have been violated, and Sven stands alone for the right to live. How he labors and endures and finally triumphs, Selma Lagerlöf tells in sheer music. A heart heavy song of her Swedish folk with all the beauty and simplicity of an ancient saga and her own deep understanding of life.

THE NEGRO PROBLEM.

Birthright. A Novel. By T. S. STRIBLING. Illustrated by F. LUIS MORA. New York: The Century Company, 1922. Pp. 309.

The value of education for the negro is here given dramatic debate. It is a problem that would concern the educational future of the American Indian as well. The negro aspirant graduates from Harvard University, and returns to his Southern home fired with the ambition to lead his colored brothers to equality with the whites, by educating them. The inevitable factors in the way of his plan merit serious thought. In the first place he is flatly confronted with and opposed by the conservatism of the South, as strong among his own people as among the whites, if not stronger. He is thrown back into the atmosphere of marked differentiation between white and black brain and is easily hoodwinked by the white trickster whom his grafted culture made him overlook. After his mother's death the ties of blood draw him insidiously beneath the surface in his attraction for Cissie, educated and struggling like himself. He emerges, his dream shattered, and makes the break for the open world and the inevitable position in a garage offered to him by a college mate.

Instead of making the leap to equality at once, as he had hoped, he and Cissie are destined merely to form links in the slowly lengthening chain of evolutional development. Nature and environment assert themselves, as ever, and triumph over the artificial conditions laid down by man.

Medicoliterary Notes.

Wellesley College has announced a research fellowship of $1,000 for the study of orthopedics in relation to hygiene and physical education. The accepted applicant will begin work in September, to continue through one calendar year. The particular problem is to be chosen in consultation with the department of hygiene, and the work is to be done in residence, except for the study and observation of clinical demonstrations.

* * *

Wall Shadows is the title of a recently published work by Frank Tannenbaum. The author was imprisoned as an incidental law breaker, and emerged from his confinement an ardent prison reformer. Although the book is propagandic in character, nevertheless it suggests several approaches to the solution of the penal problem, and the narrative as a whole, hideous as are some of the incidents it relates, is singularly lacking in bitterness or sentimentality.

* * *

Inoculation for typhoid, paratyphoid, smallpox, and cholera, involving the treatment of ten million persons, was carried on in Russia during the summer, by the Medical Department of the American Relief Administration. To supplement this program an educational campaign was instituted by the government in public health and sanitation, and practical work done of repairing sewage systems, improving housing conditions, installing chlorinators and making other improvements in health conditions in many of the cities.

* * *

My Moorland Patients is the title of a charmingly written posthumous volume by Dr. R. W. S. Bishop. The London *Saturday Review* comments on the book as follows: "To lovers of the dales, but no less to lovers of all distant and hardly tamed places, this book will come brimmed with the good things not to be found in cities. And not the least of its treasures will be the selfrevelations, perhaps the more complete because so obviously unintended, of one of those all weathers, all the year round, ultimately responsible general practitioners who are still, even in these days of specialism, the finest flower of their profession."

* * *

A bibliography of zoning has recently been issued by the Department of Commerce in response to the needs of the more than sixty cities in which zoning has gone into effect, and of the more than 110 cities in which zoning ordinances are being prepared. A section of the list covers the social and hygienic benefits to be derived from zoning. The bibliography may be obtained by applying to the Division of Building and Housing, Department of Commerce, Washington, D. C.

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Frederick A. Talbot in the July number of the *World's Work* (English) has an interesting article on the x ray as a crime detector. He describes the method by which the French police have gone "one better" on the finger print system, and now take radiophotographs of the fingers, which have been smeared with bismuth. These show up the whorls and cicatrices of the skin as boldly and clearly as if recorded in ink. The uses of the x ray in frustrating smuggling, picture faking, forgery, faulty workmanship in the industries, and other forms of misdemeanor and crime are described.

* * *

An editorial in the *American Journal of Public Health* for July makes a strong plea for action on the part of physicians, sanitarians and scientists to try to prevent the placing of high duties on scientific instruments. "The Fordney bill," says the writer, "calls for a thirty-five per cent. ad valorem duty on microscopes, photographic apparatus, projection apparatus, etc., and forty per cent. on laboratory and other scientific instruments composed of metal, and would abolish the privilege to educational institutions of free importation. No sooner had the Fordney bill got into the Senate than Senator McCumber, chairman of the Senate Finance Committee, attempted to secure the amendment of the House bill to provide a fifty-five per cent. duty on scientific instruments as well as the abolition of the duty free importation. It seems probable that thirty-five per cent. will eventually be adopted by the Senate. There the matter now stands, while all those interested are marshalling their forces and arguments to bear upon the shortsighted legislators whose vision of public welfare seems blinded by the necessity for more revenue. Of course there are two sides to the question. The domestic manufacturer needs a certain protection, but the present rate of twenty-five per cent. is adequate, and even some of the domestic manufacturers, recognizing the blow such a tariff would deal to scientific investigation in the United States, are opposed to the bill."

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New Publications Received.

ATLAS OF SYPHILIS. By Professor LEO v. ZUMBUSCH, Munich. New York: William Wood & Co., 1922. Pp. 35.

CRIME: ITS CAUSE AND TREATMENT. By CLARENCE DARROW. New York: Thomas Y. Crowell Company, 1922. Pp. x-292.

HUGHES'S PRACTICE OF MEDICINE. Twelfth Edition. By R. J. E. SCOTT. Philadelphia: P. Blakiston's Son & Co., 1922. Pp. xxlv-810.

A SYNOPSIS OF SURGERY. Illustrated. By ERNEST W. HEY GROVES. Sixth Edition. New York: William Wood & Co., 1922. Pp. viii-621.

ARTIFICIAL LIMBS AND AMPUTATION STUMPS. A Practical Handbook. By E. MUIRHEAD LITTLE. Philadelphia: P. Blakiston's Son & Co., 1922. Pp. vii-319.

ADVENTURES IN ENDOCRINOLOGY. By HENRY R. HARROWER. Second Edition. Glendale, Cal.: The Literary Department of The Harrower Laboratory, 1922. Pp. 159.

KOMPENDIUM DER TOPISCHEN GEHIRN- UND RUCKENMARKSDIAGNOSTIK. Von ROBERT BING. Funfte, vermehrte und verbesserte Auflage. Berlin and Wien: Urban & Schwarzenberg, 1922. Pp. viii-242.

ASPECTS OF DEATH AND CORRELATED ASPECTS OF LIFE IN ART, EPIGRAM, AND POETRY. By FREDERICK PARKES WEBER. Fourth Edition. London: T. Fisher Unwin, 1922. Pp. xliv-851.

A TEXTBOOK OF GONORRHEA AND ITS COMPLICATIONS. By Dr. GEORGES LUYS. Translated and Edited by ARTHUR FOERSTER. Third Revised Edition. New York: William Wood & Co., 1922. Pp. x-400.

Practical Therapeutics

THE USE OF LUMINAL IN EPILEPSY.*

By Jacob G. Greenwald, M. D.,
Skillman, N. J.,
Assistant Physician to the New Jersey State Village for Epileptics

The subject of epilepsy has engaged the attention of many investigators for a long period, and in reviewing the literature one notes the many theories advanced as to its origin and the numerous drugs and varied methods advocated in its treatment. The most recent therapeutic measure, the socalled fasting treatment, raised great hopes among the victims of the disease, but the recent investigation conducted by Dr. Frederick M. Allen on an extensive scale at the New Jersey State Village for Epileptics, demonstrated that this method was valueless.

We therefore had to fall back on luminal. This drug was first used by Hauptman, who reported favorable results in his treatment. Kutzinski, Fuchs, Kirk, and others, have obtained good results in doses of 0.075 to 0.3 gm., and Dercum has also reported satisfactory results from its use. My purpose is not to condemn the use of luminal in epilepsy, but to give my experience, results, and observations in the use of this drug.

In November, 1920, and April, 1922, 105 confirmed epileptics, manifesting the disease in various degrees of severity and who had been under observation for a long time, were selected for treatment. The patients were of both sexes, their ages ranging from nine years to fifty years and the history of seizures from the age of onset until this treatment was begun, that is, from two years to twenty-five years.

The drug was administered in one and a half grain doses once daily after supper. In five cases it was found advisable to increase this dose to three grains daily, giving one and a half grains in the morning and one and a half grains after supper, while in one especially severe case four and a half grains were given daily in divided doses. No change was made in the general routine and management of the patients. Ordinary attention was given to the bowels, keeping them active by use of cathartics, enemata, and colonic flushings. No change was made in the diet except that the quantity eaten was carefully watched, these patients receiving the same food as those who were not on the treatment. Due attention was given to routine bathing, exercise, hygiene, and rest.

The effect of this treatment manifested itself in the complete arrest of seizures in twenty-four per cent. of the cases while under treatment; partial cessation of convulsions in forty per cent. of the cases, and no impression whatever was made on thirty-six per cent. of patients under the treatment.

The effectiveness of the drug became apparent in twenty-four hours in some, while in others not before a week or ten days had elapsed. The total decrease in convulsions is best noted by comparison. One month prior to treatment the number of seizures totaled 971 grand mal and 972 petit mal; while during the course of treatment for the same length of time the number of seizures totaled 369 grand mal and 1,099 petit mal. One month following treatment with luminal the convulsions totaled 1,116 grand mal and 934 petit mal. The severity of the convulsions was noted to be definitely decreased. The convulsions changed to petit mal seizures in many cases, one patient's attacks becoming entirely petit mal serial in type. Three cases showed a decrease in furor to an appreciable degree. The drug was discontinued to note the effect, and the furor became very marked, but on readministration of the drug the furor subsided at once. Two patients showed a greater mental apathy, accompanied by gastric disturbances. Nausea, headache, and vomiting—not related to food—were the predominating symptoms. A scarlatiniform eruption appeared on three patients who were under the treatment.

Attention was drawn to a number of patients who had once been on luminal treatment and when again placed under treatment with the drug they did not respond at all, even though the dose was increased. The physical health improved remarkably; the patients put on weight, ranging from one pound to seven and a half pounds in one month. The feeling of well being was pronounced.

The administration of luminal is not free from disadvantages, and we can by no means regard it as a specific, but it is a good sedative and anticonvulsive. The discontinuance of its use causes a return of seizures of more or less severity, and the effect on the patient becomes more pronounced in a great many cases. Sands cautions its use except by trained men, mainly because our present knowledge of its mode of action is uncertain.

The administration of this drug becomes highly problematic; in private practice it must be used with great care. In cases where there is a general arrest of seizures, the feeling of well being and the gain in physical health engender a confidence in the patient and his family which becomes exaggerated, so much so that the patient is permitted to expose himself to dangers which otherwise would be avoided, and often result fatally when a convulsion does occur.

It is asserted by many workers that patients who formerly have had only grand mal convulsions and change to petit mal deteriorate more rapidly. Probably this is due to the fact that the petit mal seizures occur more frequently and are a suppression of the convulsive impulse rather than an omission. If this is true then we gain nothing by changing the character of the attack.

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3. Kirk, C. C.: *Journal of the Arkansas Medical Society*, vol. xvii, No. 4, November, 1920.

4. Grinker, J.: Experiments with Luminal in Epilepsy, *Journal A. M. A.*, August 28, 1920, pp. 588-9.

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*Prepared for presentation at the Tri-County Medical Meeting on July 15, 1922; read at the Staff Meeting of Assistant Physicians of the New Jersey State Village for Epileptics at Skillman, N. J.

A Clinical Aspect of Hypertension.—Leslie Thorne Thorne (*Practitioner,* February, 1922) divides cases of hypertension into four classes: 1. Cases of presclerotic hypertension in which the heart is not dilated and has not given way under the unusual strain. 2. Cases of sclerotic hypertension in which the heart has not given way under the unusual strain. 3. Cases of presclerotic hypertension in which the heart has given way under the unusual strain and is therefore more or less dilated. 4. Cases of sclerotic hypertension in which the heart has given way and is more or less dilated.

Treatment.—Class I: Rest from work, change of air, a healthy outdoor life, and a light diet, with sufficient physical exercise to stop short of fatigue, are often all that is required to restore these patients to health. It is important to search for and treat any source of chronic toxic poisoning such as tonsillitis, pyorrhea, or intestinal trouble. Vasal depressors are unnecessary and harmful in these cases, for they tend rather to lower the general health than to improve it. General tonics are sometimes useful, but as a rule a carefully ordered life and dietary and the treatment of any special symptom as it arises, is all that is required to cut short this first stage on the road to arteriosclerosis. As the patients of this class are usually young, it is not difficult to get them to alter their whole mode of life if necessary, but if this is not possible, absolute rest from work for a time, a careful moderation in all things, work, play, food, drink, and tobacco, will often prevent a recurrence.

Class II: These are the cases in which one or other of the drugs which are reputed to reduce blood pressure, are really useful. Their name is legion, and many of them are of little or no value, and it is often necessary to try one after another, for a drug which will produce a satisfactory result on the blood pressure in one case, will only cause disagreeable symptoms in another. The possibility of a specific history should always be borne in mind, and even if it is not obtainable, no harm can be done in trying collosol iodine, which is much better tolerated than iodide of potassium. Many private patients will not submit to a Wassermann reaction being taken, but in practically all cases in which a specific condition is the cause of the sclerosis, the iodine will be tolerated well and give good results, whereas, in those not due to syphilis, it will be badly tolerated and will produce no good result. The drugs which Thorne found most generally useful are iodide of sodium, collosol iodine, nitroglycerine, and bromide of potassium. Calcium lactate freshly prepared and given in ten grain doses three times a day, is also useful in some cases. Apart from drugs, one of the best and surest methods of treating these cases is by a course of mineral baths at a specially selected spa, for every case has to be treated according to its own individuality. The baths should be given under careful medical supervision and should never be lower in temperature than 94° F. Carbonated effervescing baths should not be given, for they generally do harm in cases of this kind. Any toxic cause should be sought for and treated, the diet should be very sparing, and regular physical exercise, short of fatigue, should be taken every day. A tumbler of plain hot or spa water should be taken two or three times a day between meals to cleanse the stomach and wash out the kidneys, the bowels should be carefully attended to, but the production of diarrhea is unnecessary, and in some cases harmful. A diet from which all meat is eliminated seriously weakens the strength and deteriorates the general condition, and, moreover, never produces a definite or maintained decrease in the blood pressure. The best diet in a case of sclerotic hypertension is a very sparing mixed diet, and it should be pointed out that the less eaten the better, for nearly all patients of this class are in the habit of consistently overeating, this habit being in many instances the cause of the disease. A little meat once a day does no harm, for if a patient is put upon an entirely vegetarian diet he will eat a great deal more than if he is allowed a little meat. No meal should consist of more than two courses, fluid should be taken after, not during, meals; well cooked toast should be given instead of bread, and no alcohol should be allowed. Drinking after meals and taking toast instead of bread will automatically lessen the consumption of food.

Class III: In these cases, in which the heart has given way under the excessive strain of hypertension, it is absolutely wrong and harmful to prescribe drugs which lower, or are reputed to lower, the blood pressure, for they will undoubtedly weaken the already handicapped heart, whether they lower the tension or not, and the patient will get worse instead of improving. Cardiac and general tonics should be given. Digitalis is not contraindicated, for it does not raise the blood pressure. The general line of treatment indicated for patients in Class II should be followed, but the dietary, although light, need not be so sparing. Patients confined to bed or those with serious valvular trouble need special lines of treatment.

Class IV: As in the case of Class III cardiac depressants are strongly contraindicated. Rest and cardiac tonics are of great use, and, if the case has not progressed too far, a carefully administered course of mineral baths, as outlined in the treatment of Class II, produces much more satisfactory results than a period of rest alone will secure. Symptoms must be dealt with as they arise, and each case will require its own modification of treatment.

The Effect of Some Diuretics on Fibrinogen.—V. Kollert and W. Starlinger (*Wiener klinische Wochenschrift,* May 11, 1922) draw the following conclusions, following a series of experiments: That a series of the most important diuretics produce a marked effect on the albuminous bodies of the blood in the sense of causing changes in turgescence. It is very likely that these properties are closely related to the diuretic powers, but this is not definitely proved, as no sufficiently complete experiments have been instituted regarding analogous processes *in vivo.* However, it is certain that the effect on the albuminous colloids is not the only manner of diuretic action (novasurol!). The new finding of the authors consists of the fact that the described mechanism of action is recognizable in the most coarsely dispersed albuminous fraction of the blood plasma and of the fibrinogen, which also has no mean significance in another direction for the recognition of extrarenal processes in renal disease.

Proceedings of Societies

NEW YORK NEUROLOGICAL SOCIETY.

Three Hundred and Ninety-sixth Regular Meeting, Held on April 4, 1922, at the New York Academy of Medicine.

The President, Dr. Foster Kennedy, in the Chair.

(Concluded from page 299.)

A Neuropsychiatric Pilgrimage.—Dr. Jelliffe showed a number of lantern slides of Déjérine, Régis, Grasset, Van Geluchten, Salpetrière: Main Gate; Charcot Monument, Charcot Clinic Building, Charcot Pathological Laboratory, Private Examination Room, Portrait, Charcot Library, Infirmary, Déjérine—Psychotheraphy. He then spoke of Pierre Marie, the present professor of neurology, of his facile and intelligent interest in all things neurological, especially in his quick vision to grasp the significance of small variations in structure and function. Dr. Jelliffe spoke of his great courtesy to American students, the first occasion for observing which he had had a number of years previously while Marie was at the Bicetre. The enthusiasm that he could arouse among his students made him the present most dominant figure in French neurology.

Dr. Jelliffe then turned to the second reunion of the Paris Neurological Society, showing a lantern slide of the members present, pointing out a number of the foreign delegates, Wertheim Salomonson of Amsterdam, K. A. Petrén of Lund, A. Wimmer of Copenhagen, V. Christiansen of Christiania, C. Negro of Turin, and a number of others. He first spoke of Dupré, whose death had just been announced, and then of Claude, who had just been elected to take Dupré's chair of psychiatry at St. Anne—a clinic made memorable by Magnan and many illustrious predecessors and followers. The nomination of Claude, he said, to the chair of mental medicine of the University of Paris was one that had met with considerable approval by his colleagues and confrères. It seemed that he was destined for neurology, as Raymond's interne, but he turned aside as winner of the gold medal interneship to internal medicine and for ten years served as preparer for Bouchard in the pathological laboratory. Here he laid the foundations for his knowledge of general pathology, of experimental medicine and of general medicine. In the field of neurology he had gathered ample harvests. In psychiatry itself as more sharply delineated it could not be said that Claude had made as yet any striking contribution to this field but the solid foundations on which he had reared his knowledge of the action of human beings left little doubt that in this field he had much to contribute.

Henri Claude was made interne of the hospitals during the year 1893, interne of the gold medal in 1896, doctor of the hospitals in 1901, fellow (*agrégé*) in neurology in 1903, assistant at the Clinic of Nervous Diseases and under this title was frequently in charge of the course at the Salpetrière where he directed the service for the nonresident psychopathic patients.

Frequently laureate of the Faculty of Medicine, of the Academy of Medicine, of the Academy of Sciences, he was a member of the Society of Biology, a member of the Society of Psychiatry, of the Society of Legal Medicine, of the Society of Neurology of which he had been president. For the last fifteen years he had been expert of the tribunals where association with him was particularly appreciated by both judges and physicians. A number of his studies were published in *L'Encephale,* of which he was one of the directors. It would be unjust to forget the services which he had rendered to the country during the war as chief of the neuropsychiatric centres of the greatest importance and a director of commissions. It was an impossible task to attempt to give an exact idea of Henri Claude's works in the limited space of this talk. His publications touched upon the broader problems of medicine, of neuropsychiatry, of endocrinology and of experimental pathology. His studies on the pluriglandular syndromes, on the method of glandular tests, on the relations of the glands of internal secretion to disorders of the nervous system, were well known.

Dr. Jelliffe said he believed *Serous Meningitis and the Syndrome of Intracranial Hypertension* constituted one of the most important works in neurology. One should add here his researches in cerebral tumors, in epidemic encephalitis, in atrophy of the cerebellum, in tumors of the protuberance, in spinal disorders, sections of the spinal cord, etc. In psychiatry his studies, his reports at conferences on epilepsy, the nature of hysteria, the rôle of the emotions in the psychoneuroses, apraxia, mental disturbances in epidemic encephalitis, dementia præcox and senile dementia made him an authority. If the moment had come when psychiatry was able to comprehend anything else than the subtle classifications remaining from generation to generation, if, following the dream of the psychiatrists of the front rank it could perhaps be impregnated by the ideas of internal pathology, of general pathology, of neurology, of endocrinology, then this was the place to hope that Henri Claude, aided by the disciples he had already made and by those who desired to attach themselves to his school, would contribute powerfully to the renovation of this science, entering more and more into the path of biological research.

Taking up the work of the congress itself, Dr. Jelliffe spoke of the method adopted by the French congresses, differing as it did so materially from methods followed in this country, in England, and in Germany. He briefly went over the main theses reported by Souques, and while it was impossible to speak of all of the factors brought out by him emphasis was put upon: 1, importance to substantia nigra; 2, encephalitis and its lessons; 3, the lack of real understanding in the congress of what is meant by emotional factors. Courbon and Lepine alone realizing what modern trends mean in the emphasis upon emotional forces and constitutional pathology.

The talk then went on and took up the work of Gustav Roussy and his coworkers, chiefly Lhermitte and Cornil. Pictures of these and the Paul

Brouss Hospital were shown, and some remarks made upon these neurologists and their researches. Roussy's brilliant work with Kalamus and many others were rapidly alluded to.

Dr. Jelliffe then showed the portraits of a group of French neurologists that had given a brilliant series of lectures to postgraduates and undergraduates at the University Medical School. (These are now available in a fine monograph, *Les Actualités Neurologigues,* Masson et Cie, 1922.)

He rapidly sketched the personalities and work done by Leri, Bouttier, Guillain, Crouzon, Sainton, Vurpas, Bourguignon, Béhague, Sicard, Foix, Laignel-Lavastine, and other representatives of present day Paris neurology. The Déjérine Foundation was then described and the portraits of Mme. Déjérine, André Thomas, and Jumentié shown. Several of the Déjérine Salpetrière groups were shown. Mme. Déjérine and Ceilliers's work on the osteoarthropathies and Thomas's work on the pilomotor reflexes shown by lantern slides.

Dr. Jelliffe then took his auditors to Switzerland, stopping with Dr. Robert Bing at Basel and then to Monakow's collections in Zurich. He showed the master at work surrounded by his pupils and then presented a number of slides illustrating Monakow's ideas of the integration of bodily function, the choroid plexus and its relations to mental and nervous disease. A rapid visit to Burghölzli Hospital and to Professor Bleuler was made and the present tendencies of psychoanalytical applications to psychiatry touched upon.

Dr. Jelliffe then want to the Neurological Institute of Vienna, showing pictures of its rooms and equipment, of Marburg, Pollak, Spiegel, and assistants in the laboratory. The recent work going on in the institute was related, particular attention was given to some of Spiegel's recent work in the vegetative nervous system. References were also made to the work of v. Economo and of Wagner v. Jauregg and the material treatment of paresis. Dr. Jelliffe spoke of the technic and the patients he had individually seen. He also alluded to later discussions held at Braunschweig with Weygandt, Nonne, and others whose results were encouraging.

From here the speaker took his hearers to Kraepelin's Clinic at Munich, which was well illustrated by a number of slides. He spoke of the death of Alzheimer, Nissl, and Brodmann, giving short accounts of these workers with all of whom he had been in personal touch. Kraepelin himself he saw in Italy and his energies were directed toward building up his Research Institute in which he had an able ally in Rudin. Dr. Jelliffe spoke of the living conditions in Munich, which were excellent on the surface but which were held together under a high state of tension. The scientific work in the clinic was as active as ever. Spielmeyer and Spatz carrying on the Alzheimer traditions and enlarging the scope of their investigations beyond purely cellular alterations.

Berlin was rapidly visited. Portraits of Rothmann, Lewandowsky, Oppenheim, and Erb were shown and brief résumés of their work given. A visit to the Vogts, with portraits, was described, and the extensive work of the Vogts and Bielschowsky outlined.

Dr. Jelliffe then gave a very rapid summary of the work done at the Braunschweig meeting of the Deutsche Nerven Aerzte. Strumpell's amyostatic symptom complex was the subject and the comparisons were drawn between the work at the Paris and Braunschweig congresses on the same subject of the physiopathology of the striatum region.

Dr. Jelliffe dwelt for a moment upon the fascinating work of Lewy on experimental studies of metabolic pathways of vegetative function. Lewy, with Brugsch and Dresel, have commenced a direct attack upon the neurology of metabolism and have shown the importance of mesencephalic structures for the integration of visceral functioning.

Brugsch, Dresel, and Lewy showed that in guineapig experiments when small localized portions of the medulla are wounded and complete metabolic analyses carried out and complete controls of the degenerated areas and secondary degenerations followed by serial sections, hyperglycemia and glycosuria took place when the dorsal vagus sympathetic synaptic zone is wounded, unilaterally and bilaterally. Lesion of this region is the cause of the socalled Claude Bernard sugar phenomena. Retrograde degeneration permits me to follow down fibres to a nucleus periventricularis where changes in the ganglion cells are present. Lesions of the ganglion cells of the ganglion habenulæ are also to be found. These authors also believe that within the dorsal vagus vegetative nucleus, sympathetic and parasympathetic cells exist. The disturbance of one group lying in the posterior third of this zone leads to a hyperglycemia, whereas lesions of the anterior portion of the nucleus tend to cause a hypoglycemia. The authors also believe that an important synaptic station in the pathways involved in the coordination of the salt and water distribution of the body is to be found in the formati reticularis on the median side of the corpus restiforme lying close to a parotid secretion zone. In an hour and a half after an injury to this zone there was a marked increase in the sodium chloride of the blood.

Dr. Jelliffe said he was forced to leave the Amsterdam workers out, but promised to return to them at a later meeting. Winkler, Kappers, Brouwer, Boumann, Bolton, Muskens, Wertheim Salomonson, V. Kleijn, Magnus, and others were mentioned rapidly.

He then took his auditors to London and the Queen's Square Hospital, the organization of which was outlined. Here English neurology was enshrined although many notable figures had never been officially connected with Queen's Square.

Dr. Jelliffe rapidly ran over Head's newer aspects of the aphasia problem and spoke of Head and Riddoch's work on the mass reflex, bringing the latter into coordination with the studies of Lhermitte on the cord and of André Thomas and the pilomotor reflexes.

He spoke of the death of Henry Maudsley and of his contributions to psychiatry, considering Maudsley almost the only figure of English psychiatry that spoke in the language of dynamic psychology. Only with the great war did English psychiatry awake from a formless static death that was difficult to understand. Stoddart among the older group alone comprehending the real situations as

Maudsley had seen them. Mercier's crabbed satire had seemed to cramp psychiatry in England almost as effectually as he himself had been locked by his venom and his rigid "logic."

That English psychiatry had begun to awaken was evident and he showed a number of slides illustrating Sir Frederich Mott's work in the gonadal changes in dementia præcox. He showed Mott at work in the new Maudsley Hospital, with lantern slides of the hospital itself. He called attention to the fact that almost every endocrine organ had been indicted by different investigators. Undoubtedly the most radical alterations were to be expected in spermatogenesis and ovogenesis, and even in the cells of Leydig—all of which Mott's sections showed were gravely altered. Whereas Mott argued, chiefly for these gonadal changes as of primary significance, Dr. Jelliffe emphasized his belief, which he had frequently expressed before this same society, that they were results and not causes. When, to use Southard's phrase, a fourth dimensional psychiatry becomes thinkable, the life movement of the organism as a whole must occupy the focus of attention. This dynamic urge, which like time forces the individual along lines of behavior, metabolic or social which have a definite entelechy. The continuance of life is life's chief function. This has been written into every cell of the body and is the essence of its expression. The gonadal system, more perhaps than any other structures, must record this push.

Nature's great aim may be conceived to be to develop adult psychosexual individuals. Practically all mankind is struggling along this pathway and halting at various levels of psychosexual evolution. The chief criteria to determine the stage of this development in any individual case are found in the unconscious. Psychoanalytical technic alone can determine this. All the previously orthodox criteria of socalled group logic are usually camouflaged substitute products. In the study of unconscious processes one may be able to determine in a manner analogous to that used by the paleontologist to determine a geological horizon, just what stage the individual has reached in his psychosexual evolution. His dynamic strivings bear a direct relationship to this grade of development, and his constitutional diseases, speaking in general, develop in definite associations with his dynamic strivings. Dr. Jelliffe said he had developed this theme before this society before and it was not necessary to go over the ground, but so far as the findings in any group of organs of the body were concerned, particularly so far as the Mott gonadal changes, the faulty psychosexual evolution of the individual, so far as his wish life were concerned—these because libido was turned away from the reality functions of life, were responsible for the changes in the bodily structures. The faulty wish caused the disease which structurally was expressed in regressive anatomical changes, and so far as conduct was concerned by a series of potency wish substitutes.

Dr. Jelliffe then proceeded to discuss the work of S. A. K. Wilson and the striatum syndromes, bringing this author's contributions in line with the work done at the Paris Neurological Conference to which Wilson had contributed, and to the Braunschweig meeting where the subject was discussed.

Letters to the Editor.

COMMON COLDS.

NEW YORK, *August 29, 1922.*

To the Editor:

Your editorial on the three c's interested me. I should like to say a word or two about colds and let some one else look after the other two c's. Everything you say goes back to the ancient and still prevalent notion that a cold is a generalized infection caused by something akin to the body "humours" of the archaic writers. Until we get rid of that notion the thousand and one general remedies now in vogue will continue to wreak their nauseating vengeance upon mankind.

The modern point of view is that a cold is an infection of the respiratory mucous membrane, an acute focal infection if you please, which is entirely and promptly curable in its early stages through local treatment. In the feverish stage, that of malaise and general depression, we have to deal with the constitutional effects working out into the system from the nasal or other respiratory focus of bacterial activity. The principles of treatment are as follows: 1. Get the nose open. 2. Irrigate. 3. Disinfect. 4. Soothe.

First spray out the nasal fossæ with a mild alkaline solution containing about one per cent. cocaine and five drops of adrenalin (1-1,000). Wait until the middle turbinates and middle meati come into view. Then irrigate with one quart of normal saline at body temperature. Next spray in a one per cent. silver nitrate solution just sufficient to whiten the entire mucosa. If there is much postnatal evidence of infection, the posterior nares must also be sprayed. Finally, spray in any agreeable oily antiseptic and have the patient return the next day. One may also advise his pet line of general treatment for the reason that he usually does not see the case until it is in the purulent stage, and consequently it is then a constitutional as well as a local infection. At home the nose is kept open by adrenalin drops, 1-10,000, followed by normal saline irrigation and oily atomization every three hours if necessary. Even the painful acute sinus infections will ordinarily respond to this treatment. If the case is unusually stubborn and even temporary immunity is hard to obtain, there is probably some endocrine imbalance, or an acidosis or chronic focal infection which makes response to local treatment tardy or unsatisfactory. Many physicians poke fun at mere "spray artists" and swab the mucous membrane with one of the black salts of silver. Spraying is the one best way to distribute a fluid—even paint is now sprayed on a surface by some great industrial concerns instead of applying it with the brush. Personally I seldom swab the nose and use colloidal silver instead of the black staining fluids. Any one who has ever had argyrol applied to his nasal interior by means of a piece of cotton wound on a stick of wood is likely to remember it for a long time—and if he happens to be a doctor one application usually effects a cure for all time. I should like to expand this note to greater length, but time and space forbid, and only the barest outline is presented above.

I. W. VOORHEES, M. D.

Abstracts from Current Literature

ENDOCRINOLOGY

Tumors of Thyroid.—Speese and Brown (*Annals of Surgery*, December, 1921) state that benign tumors of the thyroid gland preceded the development of malignancy in practically all cases. Cancer is found more frequently associated with colloid and fetal adenomata, and is relatively uncommon in simple colloid goitre. Thorough exploration of both lobes of the thyroid is indicated to prevent leaving behind a small adenomatous nodule from which malignancy may develop at a later date. When cancer is present clinically and diagnosis easy operative measures offer but little hope. The majority of cases are discovered in the course of operation or in pathological examination. The greater number of such cases are cured by operation (seventy per cent.). Early operation in all goitres is indicated to prevent malignant degeneration, which on an average has occurred 12.6 years after the appearance of the benign goitre. Toxic symptoms occasionally occur in cancer, may precede the appearance of the malignant tumor and obscure the diagnosis. Enlargement of a preexisting goitre and increase in its consistency are the first symptoms of carcinomatous degeneration of a benign struma.

Relation of Adrenal Glands to Experimentally Produced Hypotension (Shock).—Arnold Rice Rich (*Bulletin of the Johns Hopkins Hospital*, March, 1922) in the experiments reported used apparently healthy, full grown cats, and made a careful attempt to subject each animal to conditions as nearly identical as possible as regards the trauma inflicted to produce shock and the amount of anesthetic used in each experiment. The animals were considered to be in shock when the blood pressure, having fallen to 60 mm. of mercury or below, showed no tendency to recover, and was accompanied by a permanent dulling of the sensibility, so that the ether could be discontinued without discomfort to the animal during operative procedures performed after a sufficient lapse of time (thirty minutes) to allow the anesthetic effect to wear off. The following summary presents the results of these studies: Adrenalectomized animals, subjected to uniform intestinal manipulation before the blood pressure has begun to decline as a result of adrenalectomy, fall into shock exactly as do normal controls; the time required for the production of shock and the character of the blood pressure curves being the same in both instances. The conclusion is that disordered adrenal function is not a factor in the production of shock. Hypotension invariably results from removal of the adrenal glands, and with the development of hypotension the circulation of adrenalectomized animals appears to become more unstable than that of normal animals even before the appearance of asthenia. The blood pressure begins to fall several hours after adrenalectomy and becomes progressively lower until death. The fall in blood pressure is shown to be independent of the operative trauma and begins before asthenia has appeared. This is offered in support of the idea that the adrenals are concerned in the maintenance of the blood pressure at the normal level, and certain objections to this belief are briefly discussed. Animals that are kept lightly anesthetized with ether, for an hour immediately before the abdomen is opened, become very resistant to the shock producing effect of intestinal manipulation. Even when subjected to severe peritoneal trauma for a period of three hours, the blood pressure shows practically no tendency to fall and sensibility is retained. In contrast, if identical intestinal manipulation is begun more promptly after anesthetization, the blood pressure invariably begins to decline progressively within an hour, has fallen to 60 mm. or below an hour and a half to two hours after opening the abdomen, and the animal is in complete shock. An hour's ether anesthesia preliminary to opening the abdomen has proved to be a striking protective against shock, under the conditions of the experiments. If an animal is kept anesthetized for an hour, permitted to recover from the anesthetic, and at once reanesthetized and intestinal manipulation begun, the protective effect of the hour's anesthesia will have disappeared. Ether has a distinct tendency to hasten the onset of shock once the blood pressure has begun to decline after the abdomen is opened. Cardiac failure is not a factor in the production of shock. Failure of the vasomotor centre is not a primary factor in shock. The cardioinhibitory centre is shown not only to respond to stimuli but also to function independently during deep shock. Its failure cannot be regarded as a cause of the condition.

Congenital Familial Goitre Treated with Drugs.—J. Bravo y Frias (*Archivos Españoles de Pediatria*, February, 1922) reports the case of a female infant, two months old, who had been born with a goitre so large as to cause frequent crises of asphyxiation, during which her head was always thrown backward. If it was turned forward the suffocative paroxysm became greatly augmented. The father and mother were both syphilitic, but no goitre had been known in either line nor in the village. Of ten previous conceptions four children, of whom only one was living, had had goitres at birth. None of the living children was luetic. The patient weighed less than ten pounds when six weeks old and had lost instead of gaining weight since birth. The goitre extended from the suprahyoid region to the suprasternal and touched the sternomastoid muscle on each side. At its largest the child's neck was twenty-three centimetres in circumference. The tumor was not adherent to the skin, presented no inflammatory signs, and moved with the larynx and on deglutition. The baby was small in size, showed decided hypertrichosis, a dry skin desquamating freely, wide open fontanelles, and a cranial measurement of forty centimetres.

The diagnosis made was congenital goitre with thyroid insufficiency, and the treatment was thyroid extract and mercurial frictions. Iodide of potassium was not borne. Improvement was slow and accompanied by the usual vicissitudes; but in six months all general symptoms had disappeared, the child seemed normal, was only slightly smaller than others of its age, had no hypertrichosis, and the goitre was so diminished that the head was held naturally. At twenty months of age the goitre was still perceptible and the fontanelle not completely closed, but general improvement was evident. The patient's sister, eleven years old, has a very large congenital goitre and suffers from severe crises of suffocation. She is not being treated and the tumor has made slow progress for the most part, but during the last year has increased rapidly.

Congenital goitre is rare, even in regions where endemic goitre prevails, but at least is always associated there with hereditary antecedents, both in animals and in human beings. The cases described are anomalous as not being hereditary, as occurring sporadically, and as being distinctly familial. They completely contravene the dictum of Broca that there is always a maternal heredity in congenital goitre. A hereditary factor does exist here, however, in syphilis. The occurrence of a syphilitic pathogenesis is doubtful in goitre. Broca does not admit it as a factor. Finkelstein refuses to recognize it. Furst regards it as possible. Lasage admits the existence of syphilitic goitre, and Garré and Borchard consider it a syphilitic thyroiditis rather than a goitre. In this patient it is doubtful for various reasons, among them the fact that luetic treatment was not well borne and was soon stopped, so that the improvement made must be ascribed to thyroid alone.

Adrenal Feeding in Conditions of Hyperthyroidism.—J. Rogers (*Endocrinology,* January, 1922) says that several derivatives of the entire adrenal gland were tested upon dogs and found to produce physiological reactions differing materially from those of adrenalin. All were found to be vasomotor constrictors, apparently in proportion to their epinephrine content, but all exhibited also an inhibitory or "check" effect upon secretory activity which was by no means in proportion to their epinephrine content. Corresponding doses of adrenalin showed few or none of these check effects upon the pancreas and gastric peristalsis, which seemed to be brought about by the terminal filaments of the sympathetic in contradistinction to those of the autonomic system. Testing the effects of the same substances upon the iodine content of the thyroid gland in dogs, it proved that, while control animals gained the normal average amount of about thirty per cent. in iodine, those fed adrenal nucleoprotein gained about fifty per cent. and those fed adrenal residue about seventy per cent.

Applying these results in explanation of the clinical phenomenon of hyperthyroidism and of its antagonizing by adrenal action, Rogers reasons that the chief symptoms of this condition are produced through the autonomic system of nerves and are subject to check by the adrenal derivatives acting through the sympathetic system. However this may be, the stimulation must be chemical, the thyroid product on the one hand entering each nerve cell and accelerating or driving it, the adrenal product entering it and chemically restraining or checking its metabolism. In conditions of hyperthyroidism the thyroid gland contains less than the normal amount of iodine, and a defect in the metabolism of iodine by the thyroid epithelium is the probable biochemical cause of the disturbance, this defect being due to a functional failure of the thyroid terminals of the sympathetic nerves through which or upon which the adrenal product acts.

Internal Secretion of the Pancreas.—F. G. Banting and C. H. Best (*Journal of Laboratory and Clinical Medicine,* February, 1922) in the course of their experiments have administered over seventy-five doses of extract from degenerated pancreatic tissue to ten different diabetic animals. As the extract always produced a reduction of the percentage sugar of the blood and of the sugar excreted in the urine, the authors feel justified in concluding that this extract contains the internal secretion of the pancreas. The experiments submitted, the authors believe, give convincing evidence that it is the islets producing an internal secretion which controls carbodydrate metabolism. The results of the experimental work are summarized as follows: Intravenous injections of extract from dog's pancreas, removed from seven to ten weeks after ligation of the ducts, invariably exercised a reducing influence upon the percentage sugar of the blood and the amount of sugar excreted in the urine. Rectal injections are not effective. The extent and duration of the reduction varies directly with the amount of extract injected. Pancreatic juice destroys the active principle of the extract. That the reducing action is not a dilution phenomenon, is indicated by the following facts: hemoglobin estimations before and after administration of extract are identical; injections of large quantities of saline do not effect the blood sugar; similar quantities of extracts of other fluids do not cause a reduction of blood sugar. Extract made 0.1 per cent. acid is effectual in lowering the blood sugar. The presence of extract enables a diabetic animal to retain a much greater percentage of injected sugar than it would otherwise. Extract prepared in neutral saline and kept in cold storage retains its potency for at least seven days. Boiled extract has no effect on the reduction of blood sugar.

Prevention of Simple Goitre in Man.—O. P. Kimball (*American Journal of the Medical Sciences,* May, 1922) shows that iodine is taken up by the thyroid gland when given by mouth, by inhalation, or by external application. He goes on to say that it makes very little difference from a scientific point of view what form of iodine is used. It has been suggested that in mildly goitrous districts a mixture of small amounts of sodium iodide in common table salt could be made which would suffice for all iodine therapy, but he feels that the most satisfactory method is the individual oral administration of definite small amounts of some salt of iodine, either in solution or tablet form. For private use syrup of ferrous iodide and syrup of hydriodic acid are excellent. As a public health measure he uses two gm. of sodium iodide over a period of two weeks and repeats twice a year. This has prevented enlargement of the thyroid in more than ninety-nine per cent. of the children in the mildly goitrous districts with which he has to deal. The prevention of thyroid enlargement in individuals with other diseases, or residing in extremely goitrous districts, may require larger amounts of iodine.

SURGERY

Chronic Osteomyelitis.—T. S. Mebane (*Journal of Bone and Joint Surgery,* January, 1922) presents the following conclusions in his study of chronic osteomyelitis secondary to compound fracture: Of 359 cases of chronic osteomyelitis following compound fracture, thirty-three, or approximately ten per cent., were unhealed after two years of hospital treatment. Chronic osteomyelitis of spongy bone, i. e., of the epiphysis of long bones, carpal and tarsal bones, is more difficult to cure than osteomyelitis of compact bone of the shafts. Extensive tarsal involvement, where healing has not occurred within six months, requires amputation. The same applies to epiphyseal osteomyelitis, where resection is impractical. Of the long bones, osteomyelitis of the femur is the most difficult to cure; forty-five per cent. of unhealed cases were involvements of this bone. Of the operative measures, careful effacements and partial closure gave the best and quickest results, the end results of extensive effacements being excellent. The employment of chemicals at time of operation is of secondary importance. Careful, thorough surgery is of first importance. Plastic operations facilitate healing and are indicated for adherent scars or soft part defects. Refraction is frequent in chronic osteomyelitis. The femur and tibia are most frequently fractured. Union is the rule.

Osteochondritis of Femur.—J. Calvé (*Journal of Orthopedic Surgery,* October, 1921), speaking of lesions of the upper extremity of the femur, reports that the term osteochondritis appears defective, for it seems to indicate an affection in full inflammatory evolution. He prefers to substitute for it the term coxaplana proposed by Waldenstorm; it is short and makes clear the fact that the characteristic of the disease is an acquired articular malformation characterized by the flattening of the superior femoral epiphysis and the regeneration of the epiphyseal osseous nucleus; the articular contacts take place in defective fashion and frequently bring about, under the influence of fatigue or a spurt of growth, painful phenomena comparable to those of all articular malformations. These conclusions have not merely a theoretical interest. It is easy, however, without insisting too much upon them, to deduce from them the matter of practical interest, the treatment of the condition.

Fractures of Lower Third of Tibia.—E. L. Eliason (*Surgery, Gynecology, and Obstetrics,* November, 1921) has studied ununited fractures of the lower third of the tibia and concludes that the evidence points to the fact that there is a lessening of the blood supplied to the lower fragment in these cases, which condition is associated with lessened bone reparative activity. The anatomy of the part leads us to turn our attention to the anterior tibial artery for the explanation. The fact that in the elevated position the blood pressure difference between the affected and the normal limb is greatest should warn us to lower these fractures at the earliest moment. Furthermore, the exposed and vulnerable situation of the artery to this the most frequent fracture site of the tibia should be a warning to be careful not to inflict traumatism in reductions.

Thoracoscopy in Surgery of the Chest.—H. C. Jacobaeus (*Surgery, Gynecology, and Obstetrics,* March, 1922) concludes that: 1. For the diagnosis and localization of pleural and pulmonary tumors it is of great importance to make an x ray examination before as well as after the induction of pneumothorax. By making an x ray examination after the induction of pneumothorax valuable information is obtained, which completes the information already obtained by the x ray examination before the induction of pneumothorax. 2. Thoracoscopic examination gives valuable information in diagnosing and localizing pleural and pulmonary tumors, and verifies the x ray examination. 3. If it is not possible to use a pressure difference apparatus, it might be advantageous to induce pneumothorax previous to operation in the pleural cavity. 4. If a pressure difference apparatus is employed, then pneumothorax for the thoracoscopic examination ought to be induced as shortly before the operation as possible, in order that the inflation of the lung after the operation may not be rendered more difficult or impossible. 5. If the lung is inflated after the operation, more favorable conditions for the course of healing are eventually obtained.

Treatment of Congenital Hallux Valgus.—A. MacLennan (*Surgery, Gynecology, and Obstetrics,* April, 1922) gives the following procedures for the correction of congenital hallux valgus: The structures on the proximal side were divided by open incision at right angles to the axis of the toe. The toe is then forced into alignment with the other toes, causing the formation of a wide raw surface on the inner side of the metartarsophalangeal joint. A skin graft is required to fill in this gap and it is exactly formed by the redundant tissue requiring to be excised from the web between the great and second toes. Retentive apparatus (plaster of Paris) is required after the operation but it is useless before. The duplicity of the toe itself requires primary treatment.

Reconstruction of Knee Joint.—J. C. Wilson (*Journal of Bone and Joint Surgery,* January, 1922), in dealing with the subject of reconstruction of the internal lateral ligament of the knee joint, states that persistent abnormal abduction of the leg in extension without abnormal anteroposterior or lateral mobility in flexion is probably due to laceration of the internal lateral ligament, and that persistent instability due to laceration of the internal lateral ligament will require correction by surgical procedure. A fascial transplant embedded in the femur and tibia near the origin and insertion of the internal literal ligament has proved a satisfactory method of repair in two cases.

Fractures of Transverse Processes of the Lumbar Vertebræ.—G. G. Davis (*Surgery, Gynecology, and Obstetrics,* September, 1921) in a study of fractures of the lumbar vertebræ says that indirect violence plays the most important rôle in these fractures. The occurrence is noted in patients of advanced years, men beyond the age in which we would expect separation of the secondary ossific centres from the primary ossific centres of the transverse processes. The condition is often associated with osteoarthritis.

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NEW YORK, WEDNESDAY, SEPTEMBER 20, 1922

ANESTHESIA

Cases of Unusual Interest to the Anesthetist.—W. B. Howell (*Lancet,* June 3, 1922) reports a case of temporary mania occurring in connection with the use of Cotton process ether to produce analgesia without anesthesia for the reduction of a fracture of the radius. The mania appeared immediately after a second attempt to produce anesthesia up to the point where the patient was unable to answer questions and disappeared spontaneously in a short time. He subsequently took ether in the ordinary way without any trouble. This was the only case of trouble with the Cotton process ether.

A patient was to be operated upon for salpingo-ovaritis. There were no cardiorespiratory symptoms, but there was a systolic murmur over the pulmonary area. The usual preparations and technic for gas ether anesthesia were followed. The patient gradually became pale and cyanotic and the pulse failed. Death followed two hours after the anesthetic was stopped, demonstrating the uselessness of the ordinary heart examination with a stethoscope.

In a child to be operated upon for harelip, the anesthesia was started with chloroform, followed by ether before full surgical anesthesia was reached. After a few minutes there was sudden pallor, shallow respiration, dilatation of the pupils, complete muscular relaxation and eventually death. This may have been a case of status lymphaticus. The use of chloroform in inducing ether anesthesia has since been discontinued.

In the fourth case the patient died as the result of attempting to sit up during the induction of full anesthesia, thus overtaxing the heart which at necropsy showed marked fatty degeneration of the myocardium with dilatation, and was just able to function under normal conditions.

In the fifth case the patient was to be operated upon for a deviated nasal septum. There was no cardiac enlargement, but the second sounds at the pulmonary and aortic areas were weak. Nitrous oxide and ether were used to induce anesthesia and a few drops of chloroform before the full stage of anesthesia. The patient remained in good condition for a few hours, but then showed signs of collapse, which responded to stimulation. This case shows how little warning the anesthetist may get of trouble ahead by examination of the heart. An electrocardiogram taken before the patient left the hospital showed a disturbed ventricular function, probably chronic in nature. This information might have saved much inconvenience if it had been sought previous to the operation.

Anesthesia in Lumbar Puncture.—Joseph C. Regan (*American Journal of the American Sciences,* May, 1922) says that general anesthesia is very rarely required even in children, and is contraindicated in persons who are seriously ill. The only classes of patients in whom general anesthesia may be demanded are those who are exceedingly delirious and robust adults who cannot be controlled by other means, and those who are similarly insane. Rigidity of the back and opisthotonos do not indicate a need for a general anesthetic, unless so extreme as to prevent the introduction of the needle. A local anesthetic will suffice in very nervous patients. The preferable anesthetic, when one is necessary, is chloroform. The need of this may be avoided in many delirious, excitable, or very nervous persons by the hypodermic injection of one quarter of a grain of morphine sulphate and one one hundred and twentieth of a grain of atropine sulphate two hours before operation. Allowing patients to sup water during the operation helps to keep some of them quiet; especially those with epidemic meningitis. When resistance is expected it is well to secure the patient by a sheet twisted into a rope. Local anesthetics are rarely required in children, except when the operation is preliminary to the administration of a spinal anesthetic, and only in exceptional cases in adults, but it must be taken into consideration that it seems a more humane procedure. When several punctures are necessary decided objections exist to the use of cocaine, and ethyl chloride is unpleasant and hardens the skin.

Synergistic Analgesia.—Gwathmey and Greenough (*Annals of Surgery,* August, 1921) believe that morphine and magnesium sulphate synergistically used give good relaxation when supplemented with nitrous oxide and oxygen to abolish consciousness and for its added analgesic effect, or by using a local analgesic for the skin and peritoneum. Nausea and vomiting, wound and gas pain are reduced to a minimum and quite often entirely eleminated. When morphine is given as a preliminary to any inhalation anesthetic, its good effects are observed in the induction, almost entirely abolishing the stage of excitement. The nausea and vomiting occur as the patient is emerging from the inhalation anesthesia. By using magnesium sulphate with the morphine, the good effects secured in induction are retained; the nausea and vomiting are eliminated, a stage of analgesia being substituted. Morphine and magnesium sulphate give relief from pain either immediately postoperative or at other times for a much longer period than morphine alone.

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Two Cases of Oriental Sore (Cutaneous Leishmaniosis)*

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Oriental sore is defined by Darling (1) as an "infective granuloma of the skin, usually ulcerative, appearing most often on the exposed part of the body and occurring endemically in certain tropical and subtropical localities." Aleppo boil, Biskra button and Delhi boil are a few of the many names that have been given to this disease according to its geographical distribution. Its rarity in the United States is sufficient excuse for the report of two cases that have recently come under my observation.

Case I.—E. S., twelve years of age, lived in Aleppo, Syria, previous to coming to this country. He had been detained at Ellis Island and referred for diagnosis by the United States Public Health Service. He was unable to speak English and the following brief history was obtained through an interpreter. When examined on June 30, 1921, the patient stated that he had left his home in Aleppo four weeks previously. Two days later, while en route to the United States, he had spent several days at Beirut. Here, according to his statement, he had been bitten by insects and on the following day the eruption had appeared upon the face. He complained of no subjective symptoms whatever and gave no evidence of any constitutional disturbance. He had never previously suffered from any disease of the skin.

The patient was a wellnourished, very intelligent boy, in apparent good health. A general physical examination revealed nothing abnormal except an eruption that was confined to the face. This consisted of ten discrete lesions, one on the right side of the forehead, one beneath the chin, and the others on the left temple and cheek and left side of the chin. They were dull reddish, firm, elevated, flat, painless, and non itchy lesions, with firm yellowish crusts in their centres. Several of the lesions showed distinct umbilication. They were irregularly scattered about the face and showed no special configuration, such as a tendency to be grouped in a circle. One of them on incision failed to show the presence of fluid. There were no other cutaneous manifestations. The mucous membranes were normal and there was no adenopathy. The Wassermann reaction was negative and the urine contained no sugar or other abnormal ingredients.

The possibility of yaws had been considered by some of the surgeons at Ellis Island, as a spirochete had been found in smears from lesions stained by Wright's method. No spirochetes were, however, seen by the dark field illumination. It seemed certain that furunculosis could be ruled out by the lack of pain and tenderness as well as the duration of four weeks. The negative Wassermann reaction was as strong evidence against yaws as against syphilis. As the patient had always lived in Aleppo the possibility of his suffering from oriental sore was naturally suggested. Shortly after this examination one of the lesions was excised under local anesthesia and histologically examined by Dr. Walter J. Highman, who confirmed the diagnosis of oriental sore by finding the characteristic Leishman-Donovan bodies. He reported as follows:

"Low power—The small fragment of tissue shows a widely proliferating epidermis such as determines the verrucoid qualities of many of the infectious granulomas. The enlarged, distorted pegs including islands of cutis are completely filled with infiltration. High power—The epidermis is dense and acanthotic. In places there are small islands of migrated leucocytes, some of which seem to form small vesicular cavities. The infiltration is composed of epithelioid, plasma, and young connective tissue cells, numerous small round cells and polymorphonuclear leucocytes. They lie in a markedly edematous stroma of fragmented collagen. Within and without the various round cells are seen thousands of the spores of the Leishman bodies and here and there may be observed a Leishman body containing the unerupted granules. Diagnosis—Granulomatous Leishmaniosis."

Case II.—N. G. was a man, fifty-seven years of age, a native of Persia, a clergyman by profession. He had lived all his life in Persia until April, 1921, when he left to visit the United States. In the

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*From the U. S. Public Health Service. Approved for publication by the Surgeon General.

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course of his journey he traveled through Mesopotamia and India and eventually arrived in Copenhagen where he spent four months previous to sailing for America on May 19, 1922. He arrived at Ellis Island on May 31st and was referred for consultation on June 29th. The patient stated that he had never previously suffered from any skin disease and that his wife and child (an infant of six months) were apparently healthy.

The eruption consisted solely of two lesions which had appeared about two months previously (two or three weeks before his departure from Copenhagen). In the centre of the back of the right hand there was an ulcer covered by a firmly adherent, dirty yellowish crust about an inch and a quarter in diameter. Surrounding the crust was a reddish, firm, infiltrated area covering twice the area of the central crust. The ulcer gave rise to a thin serous discharge and bled easily on traumatism. It was not very sensitive to the touch and had not occasioned any pain. There was no enlargement of the cubital or axillary glands of the right side. A second lesion was situated on the right side of the neck. It consisted of a dull red, edematous, elongated swelling about two inches long, with a firm yellowish crust in the centre. There was no tenderness and no local adenopathy. The patient was a large robust man, weighing two hundred pounds and apparently in good general health. Examination of the urine showed nothing abnormal and the Wassermann test was negative.

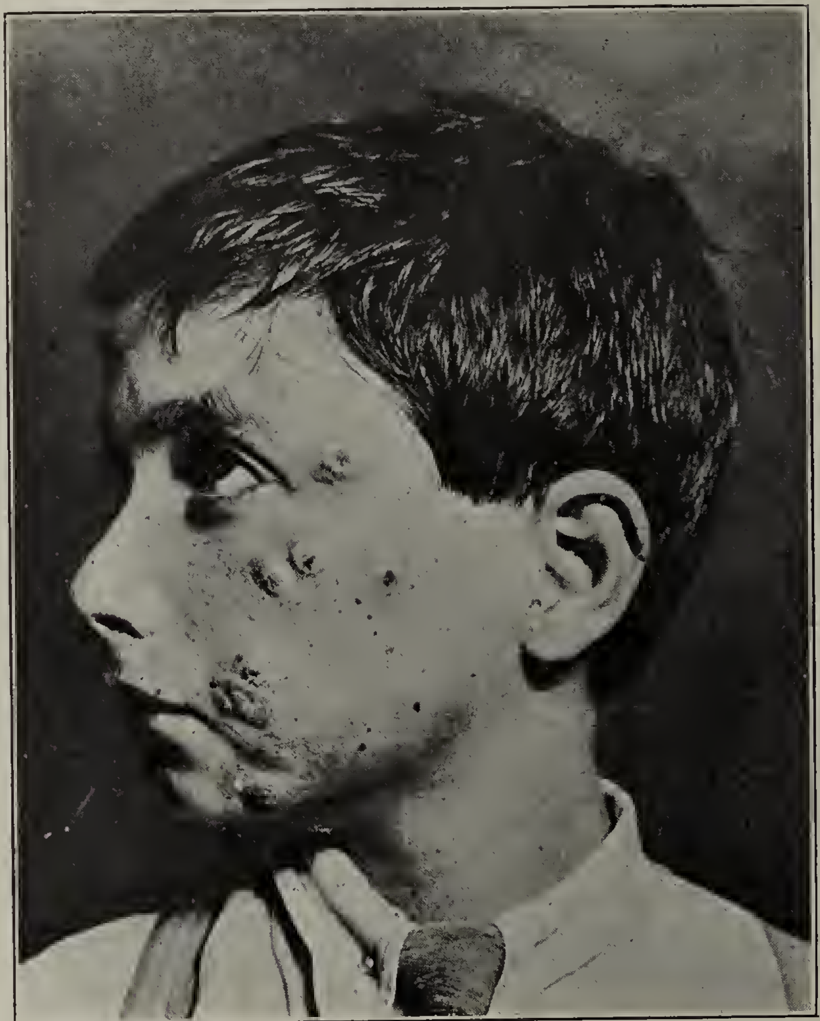

Fig. 1.—Oriental sore in patient from Persia, Case II.

On June 29th a piece of tissue from the lesion of the hand was excised under local anesthesia for microscopical study and several smears were made from the central ulcer. These were examined by Dr. D. L. Satenstein who confirmed the diagnosis of oriental sore. He reported as follows:

"Low power—Throughout the entire cutis, from the fat up to the epidermis, was a diffuse, polymorphous cellular infiltration most marked about the follicles and vessels. In the deeper cutis it was mainly circumscribed and perivascular. There was considerable edema of the entire cutis, edema of the vessel walls and dilatation of the lumen. There were no new vessels and slight increase and degeneration of the connective tissues of the deeper cutis. The epidermis was markedly irregular and hyperplastic and edematous. The follicles were dilated and filled with hyperkeratotic plugs. High power—In the deep cutis were some newly formed vessels, some of which were very thin walled, some were occluded due to hyperplasia of the walls and some of the vessel walls were infiltrated with lymphocytes. About the vessels of the upper cutis, well formed plasma cells were mainly noted. About the vessels in the deeper cutis, plasma, lymphocytes, connective tissue and occasional eosinophile cells were noted but predominately lymphocytes. Scattered throughout, singly and in groups, were varying sized Langhans cells chorioplaques and giant cells. The protoplasm was coarsely granular and nucleii of varying sizes. Near one of the chorioplaques was a deeply stained circular body containing a collection of regular rounded deeply stained granules (Leishman-Donovan body). This was about three times the size of plasma cell. There was considerable degeneration of the deeper connective tissue. The fibres were broken and in places granular."

On July 10th the lesion on the hand was frozen by carbon dioxide snow, the patient refusing to have the lesion on the neck similarly treated. As he was shortly afterward deported the final result of treatment could not be ascertained.

While the mode of transmission of oriental sore is as yet unknown, it has been definitely established that the disease is due to infection by Leishmania tropica. This organism (a member of the family of Trypanosomidæ) was discovered by J. Homer Wright (2) in 1903. A complete description of the parasite, illustrated by numerous photomicrographs, is given in the original publication of Wright. It was first cultivated in 1908 by Nicolle (3) and successful inoculations, as stated by Castellani and Chalmers (4) have since been recorded "from man to monkeys and dogs, from dogs to dogs, and from culture to man, monkeys and dogs."

That the clinical type of the disease varies greatly, is evident from the six clinical varieties described in the classic work of Castellani and Chalmers on tropical medicine. In regard to diagnosis they state that "in a certain number of cases it is very difficult to make the differential diagnosis between oriental sore and ulcers of tubercular, syphilitic or frambesic origin: also at times from cancroid when the ulcer is single and situated on the face." They consider that "the only reliable way to come to a definite diagnosis is the microscopical examination." The variations in clinical appearance are well shown by the contrast between the photographs of the present case and some others which I had the chance to publish through the kindness of Dr. Walter B. Adams (5) of Beirut. Case 1 of this report (in which there were ten lesions) was an exception to the general rule that the lesions are few in number and often single. It followed the usual type, however, in that the eruption was confined to the exposed parts of the body and was not accompanied by a local adenopathy.

While the present cases were not indigenous they serve to call attention to the presence of the disease in the New World. McEwen (6), in 1915, quoted about a score of communications referring to indigenous cases in the Americas and reported an original case of his own. The first cases to be proven microscopically were reported from Brazil in 1909. Later the disease was recognized in other countries of South America, in Panama and Mexico. McEwen says in conclusion, "that the future will find oriental sore endemic in certain parts of our country is highly probable, since the necessary requirements thereto are certain to be met, namely, the presence of the organism by importation, suitability of climatic environments and a varied and abundant insect life as an efficient agency for transmission from man to man."

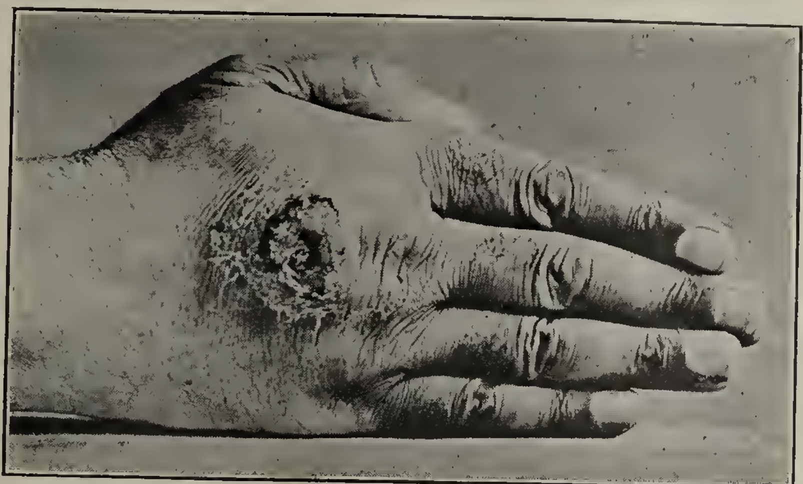

FIG. 2.—Oriental sore in Syrian Immigrant.

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114 EAST FIFTY-FOURTH STREET.

Precancerous Dermatoses

By WALTER J. HIGHMAN, M. D.,

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Within the past twenty-five years Dubreuilh originated the term precancerous dermatoses for a group of skin conditions having, as he thought, a predisposition to malignancy, to which they played the part of forerunners. Nine years ago Bowen, of Boston, described a definite cutaneous picture as the precancerous dermatosis. Darier accepted Bowen's disease, and up to the present time, including cases of these observers and one of my own, seven true examples of Bowen's disease have found their way into the literature. The concept precancerous has received rather uncritical endorsement and has acquired wide currency. Upon reflection it seems an unhappy choice, for it possesses a catchpenny quality readily adapted for the fetish worship that is often accorded brilliant expression. Thus language instead of remaining a vehicle for thought becomes perverted into a slogan. These considerations are mentioned because in employing the word precancerous I do so rather to identify the group of conditions constituting the theme of this paper than to endorse the term itself. Whether a lesion is, or better was, precancerous can be determined only in retrospect and at a time when it has become cancer. Before such a time the expression is only a prophecy, and little need be written on the value of prediction. Even in Bowen's group four of the cases were actually cancer; and of the remaining three, who knows whether they would ever have become malignant or not?

But this is no dissertation on philology. Let the term be accepted on its face value! The implication remains that there is a series of skin lesions, a substantial minority of which appear to lead to malignancy. How often this occurs in previously apparently normal skin is not recorded. Likely enough the skin itself becomes precancerous at a certain age, and if the first stage of an epithelioma looks like a seborrheal wart, it by no means follows that all seborrheal warts will become malignant, any more than that all pigmented nevi will. I have yet to see an adult without from one to twenty pigmented moles, and I question whether I have seen twenty melanomata in my life or shall see twenty more.

Precancerous dermatoses or cutaneous changes appearing to possess a more or less direct causal relation to malignancy, fall into five relatively well defined groups. As with all classification, changes might be made from one division to another, but for the sake of orderly exposition the ensuing scheme may prove acceptable.

Congenital anomalies of the type known as nevi or birth marks, on the whole, rarely become malignant unless, in the broadest sense of Cohnheim, all neoplasms are inherently anomalies. Without en-

- A. Congenital anomalies:
  - I. Pigmentary, hairy, vascular nevi
  - II. Cysts: a, dermoid
    - b, sebaceous
- B. Infections:
  - I. Tuberculosis; lupus vulgaris
  - II. Syphilis: 1. Scars
    - 2. Leucoplacia
- C. Irritations:
  - I. Mechanical: 1. Habit—smoking
    - 2. Function—nursing
    - 3. Heat—burns
  - II. Actinic and other rays:
    - 1. X rays
    - 2. Radium
    - 3. Sun—sailors' skin
  - III. Chemical: 1. Arsenical
    - 2. Chimney sweep's cancer
  - IV. Preexisting dermatoses:
    - 1. Seborrhea
    - 2. Psoriasis
    - 3. Lupus erythematosus
- D. Regressive changes.
- E. Unclassified:
  - I. Horns (related to lupus vulgaris)
  - II. Darier's disease
  - III. Bowen's disease
  - IV. Paget's disease
  - V. Xeroderma pigmentosum; related to congenital anomalies and regressive changes.

tering into a consideration of the validity of this author's views so applied, the outstanding fact remains that few nevi change in the aforesaid manner, and these few comprise true pigmented moles which occasionally herald melanomata. It is conceivable that verrucous nevi might undergo epitheliomatous alteration, but there is no recorded evidence of the fact. On the other hand, sebaceous and dermoid cysts do, at times, become the source of epithelioma, as may any congenitally misplaced ectoblastic tissue; but undoubtedly, so far as this applies to sebaceous cysts, the incidence is trifling. All in all, the relation of congenital anomalies to malignant changes scarcely suggests predestination. As a rule, when anomalies become malignant, it is found that they have been irritated by the patient or by inept therapy. One would almost be more inclined to regard the human factor as more significant than the embryonal one, for, in general, unscathed anomalies remain harmless.

No chronic infections except syphilis and lupus vulgaris which is tuberculosis lead to malignancy. Lupus vulgaris or its scars, in an infinitesimal number of instances, appears to be the starting point of epithelioma of the basal cell type. At times a cutaneous horn is interposed as an intermediate phase. There is no means of learning whether at a given site at which such a metamorphosis occurred there would not have been a cancer anyway, and it is certain that epitheliomata arise relatively as often in people who have not had lupus as in those who have had it. The same is true as to syphilitic cutaneous scars. On the other hand, syphilitic cicatrices of the tongue, interstitial glossitis, and leucoplacia are only too frequently the points of origin of malignancy to permit regarding the fact as purely one of coincidence. Here very malignant squamous cell growths develop.

Irritation plays a somewhat more striking rôle in the tragedy than do any of the already mentioned factors save lingual syphilis. Unquestionably smoking is no mean participant in the causation of cancer of the lip and tongue, precisely as mammary carcinoma, either due to the irritation entailed or glandular function, is mostly observed in women who have nursed, and almost never in men. Even the scars of burns occasionally give rise to new growths. This entire group represents the total mechanical predisponants, save actinic, radium, and x rays.

However, the last three agents rarely cause definite reactions. Sailor's skin, the result of prolonged exposure to sunlight and the inclemencies of weather, is a condition observed in the seafaring and in those pursuing agricultural or some other out of door life. The skin gets brown, leathery, lustreless, and gives rise to basal cell epitheliomata developing upon hyperkeratotic patches. In such integument a disturbance, if not degeneration, of the elastic tissue is found. There is a great similarity between sailor's and senile skin, both presenting the same category of changes. Nevertheles, of the number of individuals who are weatherbeaten, strikingly few get epitheliomata. In fact, it cannot be seriously stated that the incidence of malignancy is greater in this group of people than in any other. On the other hand, of cases of chronic radiodermatitis, especially in x ray technicians, in a much larger proportion epithelioma develop. As regards radium, comparatively little is yet known, but it is reasonable to suppose that the story of x ray cancer would be duplicated if we were not forewarned.

Malignancy resulting from chemical agents is rare. Arsenical hyperkeratosis in individuals for a long time medicated with this metal, or vocationally exposed to it, in a small number become epitheliomatous—and in the old days chimney sweeps developed like lesions, presumably from the soot with which their skin was constantly irritated.

As to inflammatory noninfectious dermatoses, psoriasis, seborrhea, and lupus erythematosus rarely occasion epithelioma—so rarely, in fact, that the circumstance may justly be ignored when the wide incidence of these diseases is considered in relation to the infinitesimally small number of malignant eventualities. Regressive changes in the skin, in short those changes characterized as peculiar to senility, have practically the same pathology as sailor's skin and lead to epithelioma about as rarely.

As stated, lupus vulgaris is the condition most commonly leading to the formation of horns, and the latter often lead to epithelioma. At best, this is rare. One instance of malignancy has been observed in Darier's disease. This was reported by Wende. In the opening paragraph Bowen's precancerous dermatosis was discussed. The term precancerous here appears distinctly to be a misnomer, as over half the cases showed frank cancer. Paget's disease of the nipple is always associated with mammary carcinoma. It can scarcely be called precancerous; it might just as well be called paracancerous, or, for all we really know, postcancerous. Xeroderma pigmentosum is a congenital malformation, terminating in the precocious formation of epitheliomata. It possesses some of the features of senile skin, and it is an embryonal, pigmentary, vascular, and epidermal anomaly which would justify placing the associated epitheliomata in that group explained by Cohnheim's hypothesis. Inasmuch as xeroderma pigmentosum inevitably terminates fatally with carcinomatosis, the condition appears to be the sole precancerous dermatosis.

Precancerous dermatoses thus, are seen to be wide in range, including congenital anomalies, infections, irritations, katabolic disturbances, and a final group of conditions difficult to classify under these headings. At best only few of them regularly lead to malignancy, except syphilitic changes in the tongue, chronic x ray dermatitis, and xeroderma pigmentosum. Rare as the last condition is, its malignant termination is inevitable; second in importance is chronic x ray dermatitis; third, lingual syphilis. In all of the other diseases or conditions mentioned that lead to epithelioma, this outcome is most unusual. The only way to determine the validity of the term would be by a comparison between epitheliomata which arose upon preexisting lesions and those which developed in clinically normal skin. This has not been done. Nearly every one with an epithelioma states that it developed as a socalled pimple or scale which persisted for months or years. The conclusion is invariably jumped at that this must have been a precancerous lesion. And yet it would be at least as reasonable, nay, more so, to consider that this had been the incipient epithelioma itself.

780 Madison Avenue.

Alopecia and Its Treatment

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It is to Sabouraud that we owe most of our present day knowledge in regard to alopecia, both to classification and bacteriology. For years there was much disagreement by the best men in Europe concerning the etiology and bacteriology of the various alopecias. Out of it all has come our present classification which is accepted rather universally by most schools.

The first type of alopecia is that of alopecia prematura. Under this caption appears two types, namely alopecia prematura idiopathica and alopecia prematura symptomatica. Alopecia prematura idiopathica is probably hereditary, it being not uncommon to meet with families who give a history of fathers and sons for many generations losing their hair in early life. Other factors which may be mentioned are compression of the arteries supplying the scalp; the application of water to the scalp which may form an emulsion with the sebum, thus forming a plug in the hair follicle. Whatever may be its cause we know that it occurs early in life. The hair may be dry or oily and usually lifeless. In most cases the scalp is entirely free from dandruff in any form. The alopecia affects usually the vertex and progresses forward. The hair of the sides and back of the scalp usually remain.

Alopecia prematura symptomatica, as the name implies, may be due either to local or general disease of the scalp or body. The general diseases of the scalp producing alopecia may be dry, waxy or greasy dandruff all of which are various stages of alopecia to be mentioned below. The local diseases producing alopecia called by T. Robinson alopecia follicularis, are ringworm, favus, impetigo, and various inflammatory conditions. The alopecia resulting from the general diseases of the body is called defluvium capillorum and results from pneumonia, influenza, typhoid, pregnancy, and other conditions. The character of the alopecia in prematura symptomatica depends entirely upon the etiology of the condition. In febrile conditions the hair is usually dry and lifeless. The scalp is free from dandruff. The alopecia may begin during convalescence or a few months after as often occurs following pregnancy. The alopecia in all febrile conditions is diffuse. The hair comes out in large quantities but is soon stopped by appropriate treatment. When determined, treatment can be instituted, as will be given below.

The second group of alopecia is the one that has been most confused and perhaps the most difficult to diagnose. The first of this group is pityriasis simplex capitis after the French or seborrhea sicca after Hebra. The latter name we shall drop as it is only confusing. Let us substitute for pityriasis simplex capitis, alopecia sicca. Alopecia sicca means merely loss of hair associated with dry dandruff. This condition usually occurs just before puberty and continues sometimes throughout life. In these cases the hair is dry, lustreless, and breaks easily. The scalp is covered with fine whitish-gray scales, which according to Sabouraud (1) first group themselves in circinate lesions and later become diffuse. The patients are first aware of its presence by an excessive amount of dandruff upon the shoulders. There is usually not much alopecia unless complicated by other forms. The condition is probably due to the spores of Malassez, discovered and described by him in 1874. They are identical with the bottle bacilli of Unna. They have been found by Sabouraud in all uncomplicated cases.

The stage of pityriasis simplex capitis or alopecia sicca passes in a few years to the second stage called pityriasis steatoides or alopecia steatoides. Alopecia steatoides marks the end of dry dandruff and the beginning of a yellow, waxy dandruff which is very adherent to the scalp. The hair is inclined to be quite oily depending somewhat upon the degree of the condition. An occasional blood crust may be seen upon the scalp. The scalp is either normal or slightly erythematous in color. In far advanced cases the scalp is quite greasy and the dandruff is soaked in oil. The condition is probably produced by the polymorphous coccus with gray colonies as described by Sabouraud (2) and his pupil Cederkreutz (3). The spores of Malassez which cause alopecia sicca are always associated with Sabouraud's coccus of alopecia steatoides. This condition will produce a diffuse and permanent alopecia if continued untreated.

We now pass to the third type causing alopecia. This condition is seborrhea capitis which closely simulates alopecia steatoides and is often associated with it. However, it is a distinct entity. It usually begins in early adult life. According to Sabouraud the skin of the nose and forehead becomes oily and shiny before the scalp is affected. The disease spreads upon the scalp from the forehead. The hair is usually oily. The scalp in early cases is oily with gaping pilosebaceous glands, from which seborrhoeic filaments may be expressed. These filaments contain colonies of microbacilli which Sabouraud (4) believes to be the etiological factor. The scalp is usually free from any form of dandruff. The alopecia of seborrhea is characteristic. It involves the frontal and occipital regions, leaving a rim of hair around the sides and back of head. This type of baldness is called Hippocratic. The condition is incurable if left untreated, but much may be accomplished by suitable treatment.

Finally we come to the last condition which causes a diffuse alopecia. This is dermatitis seborrheica. It usually begins on the scalp, but tends to spread to the glabrous skin. It manifests itself as red, yellowish-red crescendic or serpiginous lesions which are slightly elevated and covered with greasy, yellow scales or crusts. The hair may appear to be dry but is actually oily. The scalp may be oily and quite inflammatory. There is some itching. Unna believes it is bacterial in origin. All of the organisms found in the above conditions have been demonstrated in dermatitis seborrheica. Darier (5) believes a certain morbid condition of the skin exists in certain individuals called kerosis which renders them susceptible to this condition. Poor hygienic surroundings as well as gastrointestinal disorders are possibly contributing factors. Like all infections of the scalp seborrheic dermatitis is an obstinate condition and difficult to cure. Permanent alopecia results when left untreated.

For the sake of clearness I will diagram below the alopecias mentioned above with their possible etiological factors:

I. Alopecia prematura {
    Alopecia prematura idiopathica—probably hereditary
    Alopecia prematura symptomatica
        Local—bacterial
        Constitutional—toxic
            Postinfectious diseases

II. (a) Pityriasis capitis simplex
        or
    Alopecia sicca (dry dandruff)
        Due to spores of Malassez
(b) Pityriasis steatoides
        or
    Alopecia steatoides (waxy or oily dandruff)
        Due to polymorphous coccus with gray colonies of Sabouraud

III. Seborrhea capitis
        or
    Alopecia seborrhoica
        Due to microbacilli of Sabouraud.
        (usually associated with II a. and b.

IV. Dermatitis seborrhoica. Bacterial in origin according to Unna.
    (organisms of II a. and b. and III. usually found)

The above alopecias do not appear unfortunately so simply but are usually a combination of one type with another. Every conceivable combination may occur and at times it is difficult to tell which one is paramount. One must be familiar with every type in order to treat the alopecias intelligently—this brings me to the choice of drugs which are the most appropriate in the different alopecias.

Hair tonics, ointments, and shampoos have been placed upon the market by many commercial houses, barber shops, and hair dressing parlors—some persons have used these proprietary remedies with success; the reason being that they have chosen by chance a formula that was indicated in their particular case. But many others have not been so fortunate and ultimately lose what remaining hair they may possess. A tonic which may be indicated in one scalp may cause disastrous results in another.

Every tonic should possess four elements. First a parasiticide, second an antipruritic, third one or two stimulants, and fourth either an oil or a deoleizing agent—all of these are incorporated in some soluble base. Below appear those remedies most frequently used and the amounts necessary up to an eight ounce mixture, which is the most convenient sized tonic to prescribe:

Parasiticides.	
Bichloride of mercury	1 to 3 drs.
Tricresol	½ to 1 dr.
Antipruritics.	
Chloral hydrate	1 to 3 drs.
Carbolic acid	10 to 30 min.
Stimulants.	
Euresol	1 to 2 drs.
Resorcin	1 to 3 drs.
Betanaphthol	½ to 2 drs.
Formic acid	1 to 3 drs.
Pilocarpine	10 to 20 drs.
Tincture cantharides	1 to 2 drs.
Deoleizing Agent.	
Alcohol (95 per cent.)	4 ozs.
Oils.	
Castor oil	½ to 1 dr.
Sweet almond oil	3 to 4 drs.
Olive oil	4 drs.
Base.	
Distilled water, q. s. ad	8 ozs.
Lime water, q. s. ad	8 ozs.

Tonics should be used five or six times a week and should be thoroughly rubbed into the scalp. The scalp should be grasped between the fingers and gently rubbed into a furrow. This has the advantage of thoroughly rubbing the tonic with its ingredients into the mouths of the hair follicles and also bring forth an increased blood supply to the scalp. The best posture for treating the scalp with a tonic is placing the elbows upon a chair, bending the head between the legs and massaging. The tonic should be rubbed into the scalp ten or fifteen minutes each night—it is advisable to wear rubber gloves when carrying out this procedure in order to protect the end of the fingers and nails from irritating and discoloring ingredients.

Ointments are quite necessary in association with tonics but should be used on different nights. For most cases it will only be necessary to use an ointment once a week followed by a shampoo the following day. The ingredients ordinarily used and the amounts made up in one ounce mixture are:

Antiseptics or Parasiticides.	
Ammoniated mercury	1 dr.
Oleate of mercury	2 drs.
Sulphur (precipitated)	½ to 1 dr.
Stimulants.	
Derivatives of Tar—	
(a) Oil of cade	10 to 30 grs.
(b) Oil of rusci	10 to 30 grs.
Base.	
Petrolatum album, q. s. ad	1 oz.
Liquid petrolatum, q. s. ad	1 oz.
Goose grease, q. s. ad	1 oz,

An ointment should not remain on the scalp mor than twenty-four hours for fear of setting up an inflammatory process. They are much more easil absorbed than tonics but not so convenient to use—they should be washed from the scalp and hair by some good soap which may be followed by a suitable shampoo. The shampoo selected should be chosen with reference to the condition of the scalp.

Dry Scalp.

℞ Olive oil soft soap	72 parts
Alcohol (pure)	25 parts
Oil of pine needle. Menthol Eucalyptol	1 part

Sig. As shampoo. This is a good foamy shampoo with pleasant antiseptic odor. It contains no free alkali and imparts a beautiful lustre to the hair.

Semi-Oily Scalp.

℞ Olive oil soft soap	71 parts
Distilled water	25 parts
Potassium carbonate	1 part
Menthol Oil pine needle Eucalyptol,	āā. 1 part

Sig.: This is a cream shampoo and is dispensed in a jar.

Oily Scalp.

℞ Cocoanut oils soft soap	50 parts
Potassium carbonate	5 parts
Menthol Oleii . Pinis Sylvestris. Eucalyptol	1 part
Aqua, q. s. ad	100 parts

Sig.: A splendid shampoo for a scalp that is very oily with much dandruff.

In order to make myself perfectly clear let me place before you a few prescriptions which may be used to advantage in the various alopecias above mentioned. These prescriptions may be altered to suit the exigencies of the case.

Dry Scalp
(Tonic)

Hydrarg. chlorid. corros	gr. ii
Resorcinol	ʒi
Chloralum hydratum	ʒi
Spt. acidi formici	ʒi
Oleum amygdalæ express	ʒiv
Tinct. Quillaja, q. s. ad	fiat emulsion
Aqua calcis, q. s. ad	℥viii

Sig.: Apply to scalp five times a week and rub in thoroughly.

Dry or Oily Scalp
(Ointment)

Hydrarg. oleatum recentum	ʒiii
Petrolatum liquidum, q. s. ad	℥i

M. ft. mist. et Sig.: Apply once a week, following by shampoo next morning.

Oily Scalp
(Tonic)

Hydrarg. chlorid. corros	gr. ii
Resorcinol	ʒi
Chloralum hydratum	ʒi
Tinct. cantharidis	ʒss
Spt. vini rect. (alcohol)	ʒiv
Aqua destillata, q. s. ad	℥viii

M. ft. Sol. et Sig.: Apply to scalp five times a week.

Dermatitis Schorrhoeica.
(Ointment)

Acidium salicylicum	gr. xv
Sulphur præcipitatum	ʒss
Petrolatum album., q. s. ad	ʒi

M. ft. Ung. et Sig.: Apply once or twice a week. Follow with shampoo the next morning.

With the above factors in mind the practitioner can readily select his treatment to correspond with the type of scalp. It may be said that we usually have just two types of scalps to treat—those that are too dry and those that are too oily—those that are too dry should have one of the above mentioned oils incorporated in their tonic and not too frequent shampooing (perhaps once in ten days or so)—the scalp that is too oily should have a tonic consisting of alcohol in the amount above mentioned. In case an intermediary type exists, which is often true, one can modify the tonic accordingly. The ointment should be used in either a dry or an oily scalp whenever possible. It has a greater bactericidal property than the tonic. When we are dealing with alopecia prematura idiopathica we must exert our best efforts to stimulate the dormant hair follicles and also to correct any constitutional derangement. In the case of alopecia prematura symptomatica, and by this we usually mean the alopecia following post-infectious diseases, we must build up the patient generally and at the same time stimulate the scalp with tonics, ointments, massage, and actinic therapy. Alopecia sicca and steatoides are easily treated if one determines the type and carries out the above suggestions. Seborrhea capitis is so closely associated with alopecia steatoides that it is difficult to differentiate them. Consequently the treatment for the steatoid type would be appropriate for the seborrhea capitis type. Dermatitis seborrhoica is easily diagnosed and under proper treatment will quickly disappear only to recur again unless treatment is continued over a long period. At any rate it can be kept well under control by suitable tonics and ointments. I find my best results are obtained with precipitated sulphur.

There are a few practical hints concerning the use of tonics and ointments which I have found a great help. Many women desire a tonic with a faint odor of perfume in which case one may add a few drops of extract of violet, lilac or lilly of the valley. Men usually dislike perfume and unless so asked for should not be added. A pleasing color sometimes adds to a tonic in which case one may add methyl blue, violet or carmine red. This coloring matter will not affect the efficacy of the tonic, nor will it stain the hair. When recorcin is used persons with blond hair should be on the alert for color change in the hair and when noticed should be discontinued at once and another stimulant substituted. Resorcin should never be used when one has gray hair. When an ointment is used it should be made properly. All of the various ingredients should be well triturated for granules of sulphur, etc., are annoying to the patient. Liquid petrolatum makes a good base when one desires a thick viscous liquid rather than an ointment. Sulphur and mercury should never be used together for they are incompatible and form a black deposit of mercuric sulphide. Bichloride of mercury in a tonic and sulphur precipitate in an ointment are permissible if used on alternate days, especially if the ointment is washed out of the scalp before the tonic is applied. An ointment should be used in an oily scalp not oftener than once in ten days. When the scalp is excessively oily the scalp may be washed twice a week. If this does not suffice one may dust into the scalp the following prescription:

Pulverized orris	drams vi
Sodium borate	drams iii
Pulv. rice starch	drams ii
Oil violet, q. s.	(odor)

The actinic rays of either the Alpine or Kromayer lamps have been found beneficial in many obstinate cases. They are especially indicated in the alopecias following infectious diseases. A word might be said here that alopecia areata is usually benefited by the actinic rays. In alopecias associated with an excessive amount of oil it has been my experience that the condition is unimproved or made worse. I believe this is due to the fact that the actinic rays cause a stimulation of the sebaceous glands. It is only necessary to produce a mild erythema and the treatment should not be repeated until the erythema has disappeared.

The high frequency machine is of some value if used two or three times a week. The object is to set up an erythema which is difficult to do if one has much hair. This erythema is transient.

The scalp and hair should be carefully attended to from a hygienic point of view. The hair should be brushed daily for ten minutes unless it is extremely brittle and dry. The brush should contain silk or hair bristles which are reasonably stiff, placed far apart and from a half to one inch in length. A wire brush should never be used. The comb should have teeth which are far apart and whose ends are rounded instead of sharp. This is to avoid irritation. The comb and brush should be washed thoroughly every ten days and allowed to dry in the sun. One should never use another's comb nor brush. Commercial hair dyes in some instances may be used without danger for long periods, but occasionally they will set up a severe dermatitis of both scalp and face. A hair dye unless scientifically prepared should not be used. I have recently incorporated one dram of sage and sulphur in a few hair tonics to be used where the hairs were turning gray. This compound will color the gray hairs as well as the unchanged hair to a dark brown. It may be used the same as any hair tonic without any ill effects. Shampooing of the hair is more or less a personal factor. However, one should never wash the scalp daily as it is too drying. When one has extremely oily hair it may be necessary to wash it twice a week, but never more—dry scalps should not be washed more than once in ten days. Most any good soap, made by a reliable firm, may be used. All soaps when dissolved in water are very slightly alkaline. This slight excess of alkalinity is unimportant. Perfumed soaps have been unjustly condemned. Many believed that the perfume was added to disguise inferior ingredients; but fortunately this is not true. A good perfumed soap with a superior perfume would be quickly spoiled by poor ingredients. Wherever there is a fine quality of perfume added to the soap one may assume that the other ingredients in the soap are just as good. Massaging is splendid especially in anemic scalps but to be of much value should be done at least twice a week. Bobbing or shaving the hair is unnecessary as it does not stimulate the growth of hair. Singeing is a tonsorial custom which is of no value.

The prognosis of most scalp conditions is bad unless properly treated. As a word of encouragement to those suffering from alopecia let me say that most cases can be arrested and occasionally benefited to the point of stimulating dormant hair follicles; but they must be prepared to spend at least six months or more in conscientious treatment, in which they themselves are the agents to a successful end.

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Pityriasis Rubra Pilaris Associated with Dystrophia Adiposogenitalis*

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INTRODUCTION.

The unfortunate tendency at the present time to commercialize and exploit endocrinology, by the daily press, the various house organs of the manufacturers of animal extracts, and misguided enthusiasts, should not be allowed to dampen interest in this fascinating branch of medicine. Our actual state of knowledge concerning the ductless glands, particularly in their relation to the skin, is so small as to warrant a most careful compilation of clinical observations bearing even slightly on such a possible relationship. It is with these facts in mind that a report of the following case is made in the hope that it might prove of some interest.

REPORT OF CASE.

Case.—D. D., a white boy, aged thirteen, a native of Russia, came to Dr. Trimble's service at the University and Bellevue Medical College Dispensary in December, 1919, for the treatment of an extensive and pruritic cutaneous outbreak. He stated that in July, 1919, he fell off of a subway platform and suffered a severe burn of the right scapular region from contact with the third rail. This burn was still involuting at the time of his first visit to the clinic. One month after the accident he first noticed the eruption. Two months later it had become fairly generalized. He said that it first appeared in scaly patches; subsequently these patches became dry, rough, and keratotic; later on the palms and soles became hyperkeratotic.

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*From the Department of Dermatology and Syphilology of the University and Bellevue Medical College.

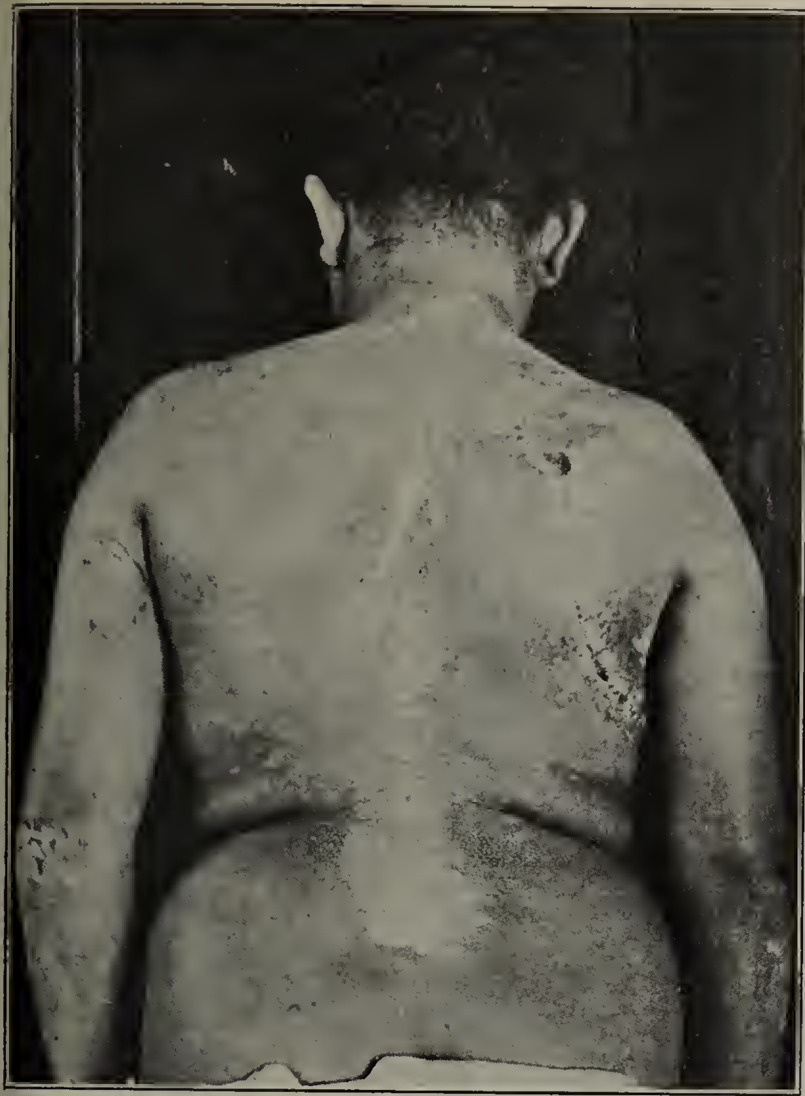

FIG. 1.—Posterior view. Note burn on right scapular region.

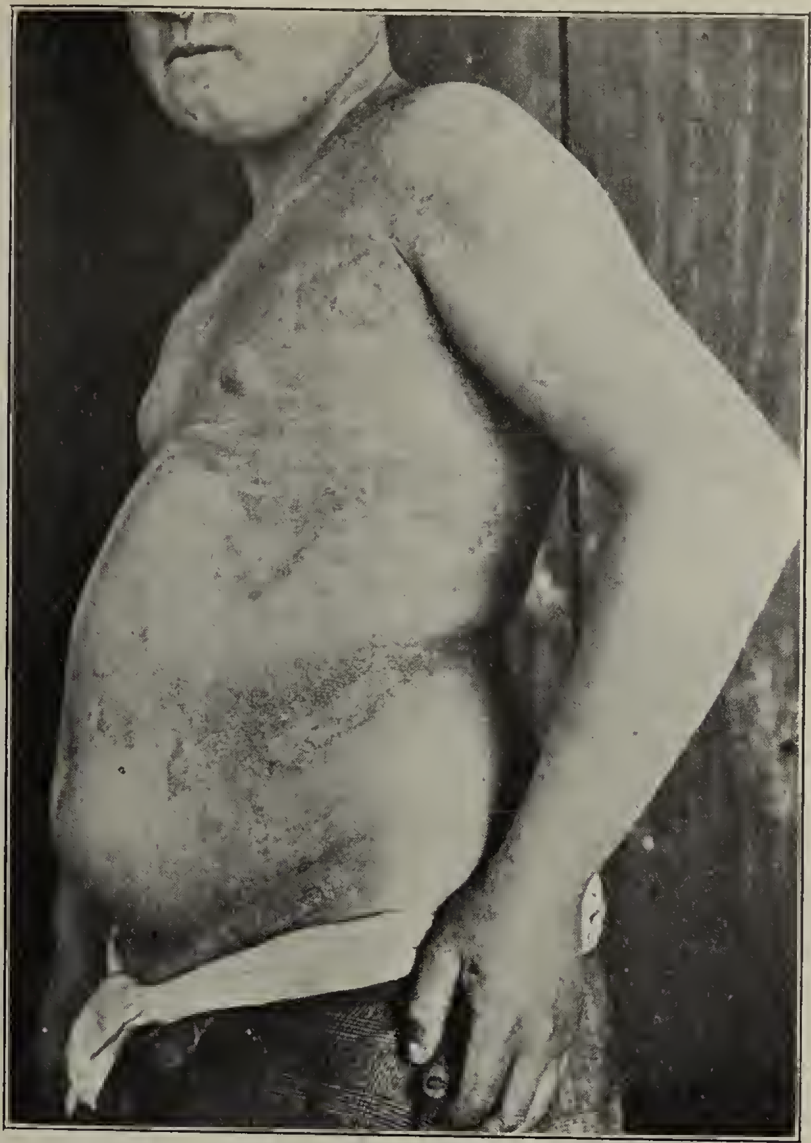

FIG. 3.—Showing the general distribution of the patches on the trunk.

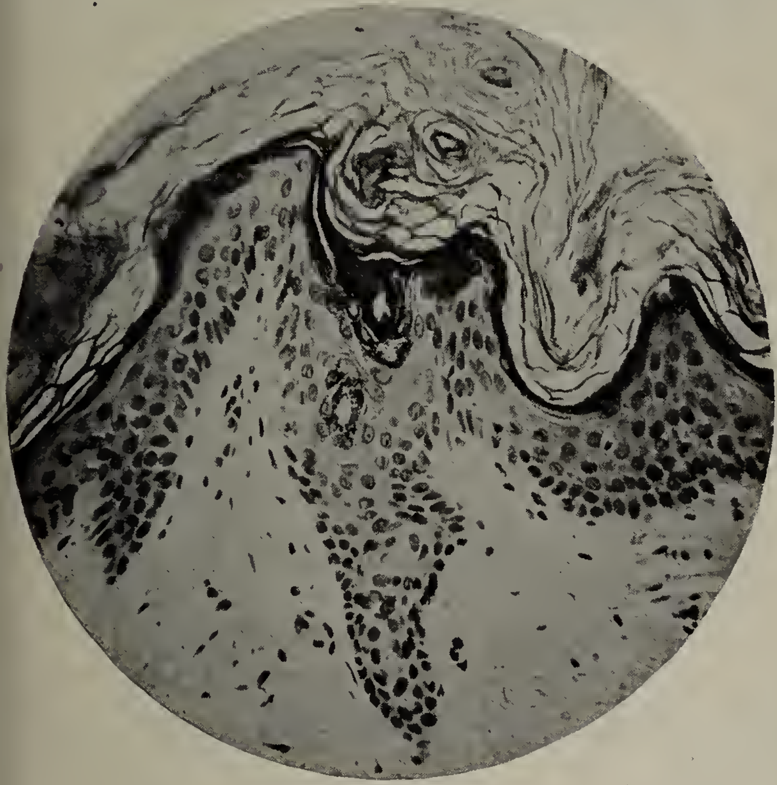

FIG. 4.—High power.

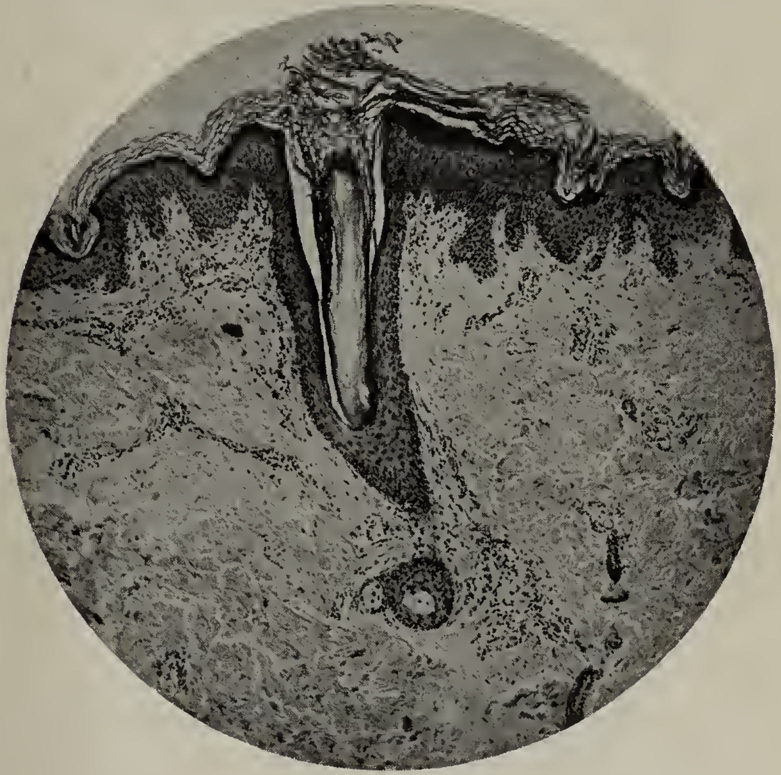

FIG. 5.—Low power.

The corneous layer of the epiderm is markedly thickened particularly at the mouth of the hair follicle. In the corium there is slight infiltration with lymphocytes and plasma cells.

His father was fifty-five years old, and in good health. His mother was also well. He had three brothers and one sister. The youngest brother had "heart trouble." The sister was married and the mother of two children. None of these members of his family had ever had any dermatological lesions or severe illnesses.

The patient was undersized, with marked obesity, particularly abut the face (the moon face type), the breasts, abdomen, and thighs; there were fat pads under the arms and over the clavicles. The genital organs were extremely infantile and atrophic. The hips assumed the feminine type. The nails showed some trophic changes, and the hands were pudgy. Even lanugo hair were not discernible either on the pubes or in the axillary regions. He seemed sluggish mentally, and was attending Grade 6B at school. The average age of his classmates was eleven. A physical examination proved negative.

A large part of the trunk and thighs were covered with patches of aggregated, red, acuminate papules, with hyperkeratosis of the pilosebaceous follicles, imparting to the touch the characteristic rough, nutmeg graterlike feel. There was considerable branny desquamation. The epidermis of the palms and soles were greatly thickened, hard, and horny. On the dorsum of the fingers were hard, black, hyperkeratotic follicles.

A biopsy was made from a lesion on the shoulder. There was marked thickening of the corneous layer of the epiderm, which was particularly marked at the mouths of the hair follicles, forming plugs. The papillary layer did not show any marked areas of thickening. About the hair follicles and in the corium there was slight infiltration with lymphocytes and plasma cells. The sweat and sebaceous glands were few in number and small in size.

The patient was given pituitary extract (posterior lobe), in tablets of a half a grain each, three times a day. Plain petrolatum was used externally. There was a marked and progressive improvement in both the eruption and the hypopituitary state within a few weeks. Unfortunately the patient was somewhat irregular in his attendance, and after two months or so disappeared from observation.

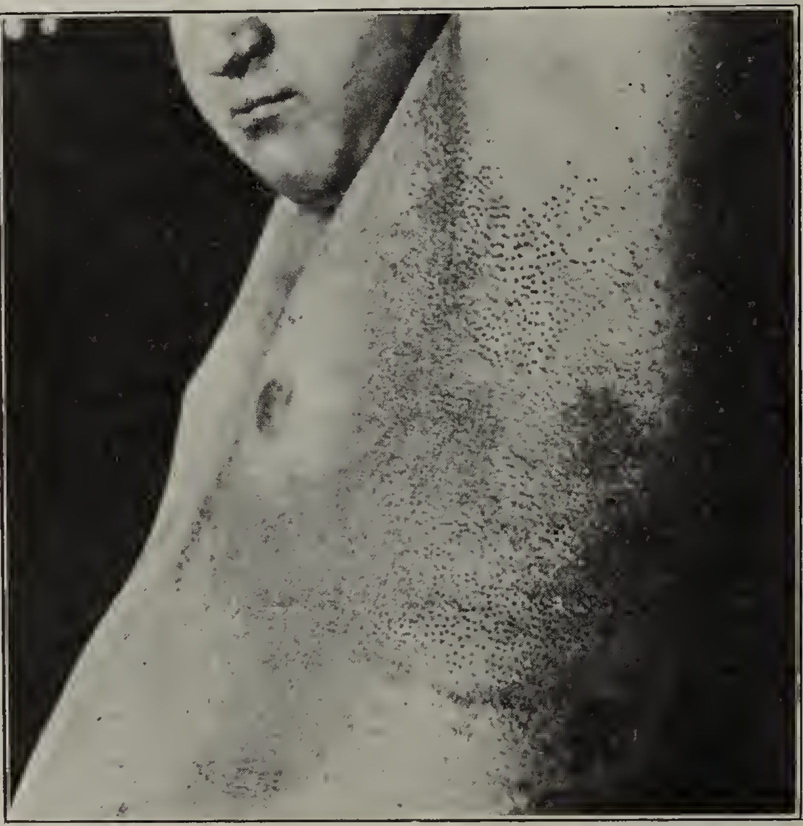

FIG. 2.—Showing the aggregated, acuminate hyperkeratotic papules.

COMMENT.

Levin and Smith (1) reported a case of pityriasis rubra pilaris cured with thyroid extract. Their case showed definite symptoms of hypothyroidism. The case now under consideration showed definite symptoms of hypopituitarism, with marked improvement in eruption and endocrinological manifestations from the administration of pituitary extract. In my opinion these cases do not present any proof of the specificity of either thyroid or pituitary extract in pityriasis rubra pilaris; they may dismally fail to have the least effect in the next dozen cases of this disease. On the other hand it might not be improbable to expect some benefit from the administration of a glandular extract, in a dermatosis of unknown, or obscure etiology, associated with definite symptoms of hypofunction of the same gland administered. In other words, to administer glandular extracts for dermatological lesions, without any evidence of dysfunction of one or the other of the ductless glands, seems absurd. At the same time, given definite symptoms and surface markings of dysfunction of one of the endocrines associated with a dermatosis of unknown etiology, it is both good therapeutics and common sense to administer the particular gland which gives evidence of dysfunction in the patient. The future of endocrinological therapy therefore depends largely on the careful study, interpretation, and classification of the surface markings, and other manifestations of the diseased glands and not in the haphazard administration of glandular extracts, for no other reason than because it had benefited this or that case. It is such methods which bring ill repute to the therapeutic end of endocrinology. I desire to thank Dr. Trimble for the use of the material, and Dr. Darlington for the pathological report.

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40 EAST FORTY-FIRST STREET.

Diagnosis and Treatment of the More Common Diseases of the Skin*

By EDWARD PISKO,
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Dermatology is only a branch of medicine and as such we meet here, too, the same pathology; anemia hyperemia, hypertrophy, atrophy, new growths, and other conditions as the outstanding features and factors of disease. I am going to attempt to give, out of the various groups, the diagnosis and treatment of a few of the more common diseases of the skin. I shall also include those of parasitic origin, the first group being of external origin and the second group of internal origin. The first group comprises all skin diseases due to heat, light, trauma, or injury, hyperemia inflammation. The most common ones are due to excessive heat or excessive cold. There are all degrees of burns including sunburn and sunstroke. We also have freezing, especially frozen ears, noses, hands, and feet. I treat all these cases exclusively with ice for the first forty-eight hours, followed by soothing ointments such as balsam Peru and ichthyol. In this group belong all varieties of exanthemata, erythemata, all forms of dermatitis, erysipelas, eczema, urticaria, impetigo contagiosa, herpes zoster, psoriasis, and acne vulgaris. I wish to emphasize that I give local treatment invariably and also internal treatment except in parasitic skin diseases.

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*Read before the Clinical Society of the Hospital for Joint Diseases, March 14, 1922.

IMPETIGO CONTAGIOSA.

This is an acute inflammatory disease, the lesions-vesicles and pustules are of a superficial character, highly contagious, appearing mostly on the face, scalp, and hands. In a few days the lesions crust over and appear to be stuck to the skin. Underneath there is oozing and this being superficial the redness disappears and no scar formation results. My treatment consists of Burow's solution, ice cold, and after removal of the crusts application of from a two to ten per cent. ammoniate of mercury ointment.

The prophylaxis of this condition is most important, especially to school children.

HERPES ZOSTER.

Here we have another acute inflammatory process which follows one or more of the cutaneous nerves. Vesicles appear in groups. The eruption being unilateral, usually appearing over the intercostal nerve. The eruption is accompanied by neuralgic pains. I use for treatment ice cold packing for four or five days, then paint with a fifty per cent. ichthyol solution.

ACNE VULGARIS.

This is a functional disorder of the sebaceous glands caused by an occluded excretory duct and first appears as a black point, mainly on the face, neck, chest, and back. For treatment hot applications are applied containing resorcin and bichloride of mercury. The pus being brought to the surface the pus foci are then opened because all pus must be removed. If necessary a comedo extractor or even a sharp curette may be used. Acne vulgaris cannot be cured with pus present. Afterwards I use a peeling paste consisting of twenty per cent. sulphur and ten per cent resorcin for about ten days. No water must be applied. As I consider the origin of acne vulgaris as due to disturbances in the gastrointestinal canal my treatment is directed to a proper diet, a tonic laxative, fresh air, outdoor xercise, and at times change of climate.

PSORIASIS.

Psoriasis is a chronic inflammatory disease. The esions begin as small reddish elevations which oon become covered with whitish or mother of earl color scales. On the slightest scratching a mall drop of blood exudes due to a hemorrhage rom the finest capillaries. This is most usual on he extensor surfaces of the extremities especially bout the elbows and knees, scalp, finger, and toe ails. In psoriasis as well as in acne vulgaris the onstitutional treatment is imperative. All bodily unctions must be regulated. The food must be restricted to vegetables only, no tea, coffee or tobacco. I give arsenous acid in pill form beginning with from one sixtieth to one tenth of a grain after each meal given indefinitely in all chronic cases. Arsenic has no effect in the acute stages. I also inject five grains of sodium coccodylate twice weekly. Locally hot baths with green soap and scrubbing of from forty-five to seventy minutes until the papules are bleeding are given. I then paint the lesions with ten to twenty-five per cent. chrysarobin and five to ten per cent. salicylate acid, the latter for the keratolythic effect in Merck's traumaticin.

Of the group of hypertrophies I want to mention the two most common ones, verruca and clavus.

VERRUCA.

Verruca is a circumscribed epidermal papillar growth which is well known. Of great importance is the verruca senilis because epitheliomatous degeneration may start in these lesions. Verruca acuminata is the veneral wart around the genitals and anus. My treatment is curettage, caustics, electrolysis and fulguration (high frequency spark).

CLAVUS.

The famous corn is composed of hypertrophied epidermal cells; it is a growth pressing upon the papillæ of the corium, thus producing pains. My treatment consists of softening the tissues in a strictly aseptic way, then repeatedly painting with one or two coats of twenty-five per cent. salicylic acid. The group of new growths includes among others keloid, molluscum contagiosum, epithelioma, lupus vulgaris, angioma and Paget's disease of the nipples. Among the diseases of the sweatglands I want to mention as the most common of all

HYPERIDROSIS.

This is a functional disorder of the sweatglands in which perspiration is excreted in an excessive amount, the odor is offensive, and in severe forms maceration occurs which is unbearable. I use for this condition astringent solutions, especially salicylic acid and formaldehyde, but no salves. Of the diseases of the hair follicles the most common are the various forms of alopecia.

Of the diseases of the nails the most common are onychia and paronychia, both being most obstinate as regards treatment.

We will now consider the last group of skin diseases, those vegetable and the animal, of parasitic origin. The most common of the former are the well known bearded face (barber's itch), tinea tonsurans, ringworm of the scalp, and the ordinary tinea circinata. For treatment I use alcohol followed by formalin.

Of the animal parasites the most common ones are the pediculus (louse) and the acarus of scabies.

SCABIES.

Scabies is a highly contagious disease due to an animal parasite. It is accompanied by intense itching becoming worse at night when the patient undresses, scratching is induced which brings about inflammation and increases the lesions. The favorite locations are the interdigital spaces, the flat surfaces of the wrist, arm, the anterior and posterior axilla, the mammæ and the nipples in females, the glans and the shaft of the penis and the inner sides of the thighs and legs. When the patients are covered with bedclothes there is constant scratching with the infected nails. This causes multiform eruptions. In tenement house children where one bed may be occupied by two or more members of the family the disease is quite common. For treatment first give a prolonged bath as hot as can be borne, scrub with green soap, even if the lesions bleed freely, and then for four or five days in succession apply sulphur three or four times a day. For the treatment of children I add balsam of Peru. It is wise to always ask whether anybody else in the family scratches themselves or whether similar lesions are present. Good judgment is needed in not overtreating with sulphur in order to prevent sulphur dermatitis followed by eczema which is a more serious affair to deal with than the scabies. Disinfection of all underclothing, bedlinen and all articles likely to harbor the parasite is imperative. In order to bring about a complete cure all members affected in the same family or of the same household must be treated at the same time.

CONCLUSION.

In conclusion in parasitic diseases there is no internal treatment. In all other diseases of the skin due to excessive acidity treatment must be directed toward the blood, the lymph and nerve structures, and also toward the functions of the ductless glands, the thyroid, pituitary and adrenals.

A Case of Leprous Keratitis Punctata*

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Leprous keratitis punctata is rare in this country. I present this interesting case because there are only four or five cases of this disease recorded in the literature.

CASE.—S. R., male, thirty-seven years old, came under my treatment on April 24, 1912, for keratitis punctata of his right eye. It ran a chronic course. After being treated for five months with the usual medication of potassium iodide, atropine, yellow oxide, dionin, hot compresses and regulation of diet, the patient completely recovered with 20/15 vision. At that time the Wassermann reaction was negative.

On June 15, 1920, he came again under my treatment for his left eye. He complained that the vision of his left eye was blurred for two weeks previous and that it appeared to him as if a veil were in front of it. The examination of the left eye revealed the following: The pupil was three mm., round and reacted to light and accommodation. There was slight ciliary congestion in the upper quadrant and to the left of the cornea; there were numerous grayish white dots and maculæ, some round and others irregular in shape, just beneath the epithelium, and a number of linear striæ; a network of minute, deep and superficial bloodvessels resembling a brush, starting above the limbus and ending at the centre of the cornea. At no time did the patient complain of pain or photophobia. The acuity of vision was reduced to 20/200—. When I questioned the patient about his physical condition, he answered very reluctantly. Remembering the stubborn attack of keratitis punctata of the right eye eight years ago, I informed the patient that unless I knew everything concerning his physical condition, I would not be able to do much for him. I finally elicited the following history from him:

He was born in Russia, came to New York fifteen years ago, had always lived in or around New York, and as far as he knew, had never been exposed to leprosy. About four and a half years ago he began complaining of itching and pinching about his left thigh and leg. After seeing a few physicians he was referred to Dr. Binford Throne who reported the following:

The patient had parasthesia of the left leg, thigh and buttock; there were eight or ten brownish red, waxylike nodules varying in size from a small pea to a ten cent piece on the left leg and thigh and also a few of these nodules on the other leg and lower part of the trunk; the epidermis covering them were never involved. The face, ears, neck and upper extremities were free from lesions; there was no coryza; no areas of anesthesia were found. Smears from the nose and throat were negative. A nodule from the left thigh was excised and examined and numerous lepra bacilli were found. The Wassermann was negative.

The patient is being treated at the Skin and Cancer Hospital with intermuscular injections of Heisler's mixture, a combination of Chaulmoogra oil, camphor oil and resorcin. At present the skin condition is stationary and the paresthesia is greatly improved. Beside these injections once weekly, the patient is being treated with atropine, yellow oxide, dionin and warm compresses. The patient is still under treatment. His vision has improved from 20/200— to 20/30.

According to DeSchweinitz, leprous keratitis is a late manifestation of the disease which somewhat resembles interstitial keratitis.

The *American Encyclopedia of Ophthalmology* gives the following description: Keratitis is found in both the tubercular and the macula-anesthetic varieties; the types seen may be superficially punctate, the deep parenchymatous and that marked by the formation of granulatomatous tumors.

The parenchymatous keratitis of leprosy follows infection from the ciliary body and from the deep scleral vessels. The infiltration begins at the corneal quadrant, extending from the limbus inward toward the centre; at first the process may be rapid in development and, though the active agent may be dormant, remains stationary for a year or so, and then a fresh invasion may occur until the whole cornea is involved. Ulceration may occur. It probably is the only one of the leprous lesions of the eye that is painful, for it is usually attended by severe pain. The difference between the leprous and the ordinary interstitial keratitis is that the membrane in the former becomes white and thickened. Usually one eye becomes affected only to be followed sooner or later so that the condition may frequently be found symmetrical.

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158 Vernon Avenue.

A Bacteriological Study of Cutting Oils Causing Skin Lesions

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The irritation, together with acneform and ulcerative forms of dermatitis, or crops of furuncles arising in those engaged in the manufacture of cutting oils or in paraffin workers has received a great deal of attention.

In a recent article Page and Bushnell (1) describe what they term oil folliculitis, and in their opinion it is due to a mechanical plugging and inflammation of the follicles of the skin. Knowles (2) cites a number of instances where dermatitis and eczema occurred in individuals who handled oils and greases.

During the past several years I have been greatly interested in this question, principally from a bacteriological viewpoint, because complaints were made by a number of industries that a certain cutting oil was causing severe lesions of the skin and that the workmen threatened to quit work if this oil was not removed from the shops. Repeated examinations of this oil and of its integral ingredients just freshly mixed and after its use, failed to show any staphylococci or any bacterium of suppuration. These negative findings, even where boils occurred, led to a large amount of experimentation in an effort to locate, if possible, the cause of these different lesions. In one plant, where I made a survey of the shop and the employees, one individual told me that he even had a urethral discharge brought about by the irritation of this oil!

It is a common thing to see in some workmen a rash or acneform eruption upon the forearms, hands, thighs and sometimes the face and neck. Where overalls are worn and these become soiled or saturated with the oil, wherever the garment touches some form of a lesion results. The lesions upon the forearms, face and neck result most likely from soiled hands being applied to these regions or to the habit of wiping off the forearms with cotton waste and using this time and again. During intervals one could see workmen with folded arms, and this contact, soiled hands upon the forearms, undoubtedly played some part in keeping up the irritation. Just how the lesions are brought about it is not quite so easy to say as there are in my opinion several factors to consider.

First, personal idiosyncrasy or susceptibility to oil or greases.

Second, mechanical irritants, sharp particles of brass, iron, steel or other metals, removed during the cutting process.

Third, chemical irritants in the oil—higher paraffins as benzene, xylene, and toluene.

Fourth, infective agent—staphylococci—upon and in the skin of the individual.

Fifth, anatomical peculiarities, sweat glands, hair follicles, etc.

Some individuals, when vaseline or ointment such as Deshler's salve is applied to the skin, show profuse redness and sometimes itching and burning, which indicates a very sensitive skin and also an idiosyncrasy to such medicaments. Another indication of a sensitive or a susceptible skin is the frequency of an irritation or even a dermatitis when xylol gets upon the skin of an individual. In another instance these materials can be used with impunity by many, just as some workers in laboratories handle these reagents or even acids without any irritation being brought about.

The exact nature of the part played by mechanical irritants as sharp particles of brass, iron, steel or other metals is problematical. In some industries the cutting oil used in the work feeds automatically and runs along a trough and returns again and again during its use. Some of the workers indulge in chewing tobacco and expectorate directly in this flowing oil. Others, though not tobacco users, also unconsciously expectorate into this trough.

A specimen of this used oil was centrifugalized and after pouring off the supernatant fluid water was added to the tube and repeatedly centrifugalized. A perceptible sediment was apparent, which, when examined microscopically, was made up of countless irregular fragments of metal, together with vegetable cells and unidentified foreign particles. It is possible that these microscopic particles of metal act as irritants to the skin, or, when the workman wipes his arms or hands with cotton waste used for the machinery, that these particles are rubbed into the skin and obstruct the ducts of hair follicles or glands, or cause slight lacerations. This process may also explain the occurrence of rashes or eruptions upon the thighs. It is possible for these small particles to be rubbed into the overalls as they are worn for a number of days before changing for clean ones.

The part played by chemical irritants in the oil, as the benzenes and xylenes, all who have worked in scientific lines where these are used know that they are distinct irritants to the skin. Any one cleaning gloves or wearing apparel with benzene, not used to this process, as a rule suffers discomfort for a time. In the laboratory where xylol is used in many procedures, here again irritation is noticed in some workers. So it is with the workman where cutting oils are used. These higher oil products or higher paraffin products must irritate when wiped into the skin time and again with dirty hands or with dirty waste or using overalls not cleansed for a time.

In most cases of acne or furunculosis noticed in these workmen, staphylococci are the common organisms found. The vexing question to the manufacturer of these oils is what is the source of these organisms? When the histology of the skin is understood, it is readily explainable that in the deeper layers of this structure saprophytic staphylococci are almost always present. These cannot all be removed from the skin by cleansing or disinfecting methods because they are too deep in the tissues. When the follicles or ducts in the skin become occluded, these organisms naturally are continually increasing in number, and as a result they become changed in their behavior and become pyogenic. Pus being formed, we have either acne or furunculosis as the case may be or probably both.

Therefore, taking the presence of staphylococci and the anatomical structure of the skin; layers of epithelium, sweat glands, hair follicles and sebaceous glands, and the blocking of these organs or ducts, or the irritation and desquamation of the superficial layers of epithelium, makes a focus or nidus for these bacteria and hence a lesion results, which persists as long as the exposure to the chemical is maintained. I have seen one case of chronic, stubborn deeply ulcerative dermatitis in an individual who had been engaged in making up cutting oils.

I have examined a number of samples of oils and bases, but have never been able to demonstrate the presence of a staphylococcus in any preparation. I have found bacilli, both spore bearing and nonspore bearing, in kerosene and used oils, but in the base and the cutting preparation before use, they have invariably proved to be sterile. Naturally, where a manufacturer receives complaints about his product, he is rather anxious to find out, if possible, where the trouble lies. To this end, a number of experiments were tried upon individuals and rabbits to demonstrate the production of dermatitis, acne or boils from the application of the cutting oil.

Liberal applications were made upon the forearms of four healthy individuals and this preparation was left upon the skin for two and a half hours a day upon three or four successive days. After each exposure the oil was washed off and the arms thoroughly cleansed. No irritation of any kind was noticeable. Several white rabbits were then experimented upon and after the hair was removed from one side of the body, liberal amounts of the oil were rubbed upon the skin several times a day for three or four days. White rabbits were selected because the skin was almost whitish or pinkish and inflammation or irritation could easily be noticed.

No lesion of any kind was demonstrable in these animals. A small quantity—0.5 to one c. c.—of the oil was injected subcutaneously into rabbits and guineapigs—no evidence of suppuration was appreciable. Used oil was also inoculated with negative results. It is hardly possible that a compound made of lard oil with sulphur added and exposed to over 300° C. for several hours would contain living pyogenic cocci.

Many specimens of the newly made oils and mixtures with paraffin oil were studied bacteriologically, but as mentioned before no evidence of bacterial growth was present.

The base of the cutting oil was found to exhibit some antiseptic action against staphylococci after sixty minutes' exposure, but where this was diluted with paraffin oil (eight parts) no antiseptic action was noticeable. In some studies a germicidal action was noted, as no growth took place upon the tubes up to five days, where the base was used alone.

These results were obtained by taking fresh pus and mixing it with the base or the diluted base in equal quantities, and then inoculating upon culture media. In other studies, one part of pus was added to five parts of the mixtures or preparations of oils. The results, however, were the same. In only one instance was a culture of staphylococci used, as it was thought best and fairer to use freshly obtained pus. Continuous shaking or agitation of the tubes or flasks was practised during these examinations and, after certain intervals of time (five, ten, thirty, and sixty minutes, up to three hours), inoculations were made upon culture media. The resulting growths were just as abundant and made their appearance just as early as the controls.

During the epidemic of influenza in 1918, in one factory in Ohio not one man quit work or was ill during that time, and it was generally thought that this cutting oil was a form of a prophylactic against the disease, although no one took it internally or used it otherwise than just at his work. The manufacturers then thought of the addition of a germicidal agent to the oil, with the idea of killing or preventing bacterial development during its use.

Quite a number of chemicals were used for study including pine oil, hycol, saponified cresols, lysol thymol, betanaphthol, carbolic acid, oleate of mercury, oleate of copper, chlorlyptus, copper sulphate paraform and copper chloride. Brilliant green and acriflavine were thought of but were not soluble in oil so could not be used. When these variously treated oils were rubbed into the skin of a rabbit irritation and redness developed, especially where cresol, carbolic acid and lysol were present.

In the studies where these treated oils were used exposures were made up to three and six hours using one part of fresh pus and five parts of the treated oil. Only two substances really showed an antiseptic or germicidal action. These were two per cent. paraform and one per cent. chloride of copper. Thirty minutes' exposure to the two per cent. paraform was necessary to kill the staphylococci (tubes remaining sterile up to fifteen days) and one hour's exposure to one per cent. chloride of copper was needed to destroy the staphylococcus. Most of the other chemically treated oils were tried up to six hours, with very feeble antiseptic action in some, but no distinctly germicidal action. Naturally these chemicals were all added in proportions which would not cause any undue irritation of the skin.

One very important point in the prevention of skin lesions lies in the manufacture of a cutting oil eliminating the factors which act as chemical irritants. Petroleum oil would naturally be irritating but asphaltum oil would act as a greater irritant. A rancid lard oil should not be used for the making of the cutting oil.

SUMMARY.

It has been a very common thing to observe in those workers in or with oil a condition, either of an acne, a dermatitis or furunculosis.

Various factors have been put forward as the causative agent in these conditions. Some have mentioned the irritating properties of the higher paraffin, others have mentioned the presence of the particles of metals, while all mention the personal cleanliness of the workers.

I believe that all these factors play a part in the production of these conditions of the skin and particularly the ones regarding personal cleanliness and particles of metal. (In miners, and in those who handle coal, many of these individuals are affected with acne or blackheads and even furuncles. Here the foreign particles can be very easily seen, but the particles of metal from cutting are very much smaller and not discernible to the naked eye.) While these workmen believe that they are cleanly, merely wiping off the oil with waste or rags does not bring about cleanliness of the parts. Hot water or good warm water and plenty of soap will clean the oil off and at the same time cleanse the skin. Naturally, this takes a little time to do and workmen are averse to spending much time in cleaning up as soon as work is finished. Another factor in personal cleanliness is to change underclothes or overalls at least twice a week. Serviceable wash rooms should be established to allow proper changing of clothes and for washing after work is done.

The presence of staphylococci or streptococci in fresh or used oil is exceedingly rare, and therefore the alleged presence of these organisms in freshly made oils should not be accepted as the whole cause of the conditions cited.

The addition of antiseptics or germicides to the cutting oils appears to exercise very little, if any, action upon pyogenic bacteria in pus, or in the prevention of infections of the skin.

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The Value of X Ray in Skin Diseases*

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I have attempted to prepare only an outline of the underlying principles and will as briefly as possible describe the conditions in which x ray is useful in skin diseases.

In order to obtain the benefit of x ray in diseases of the skin it is necessary that the operator possess a modern outfit, which should be safe to the patient as well as the operator, and with which an accurate and exact dose can be given. A fair knowledge of the apparatus on the part of the operator is a requisite as well as an understanding of the biological action of the x ray.

The x ray is a potent factor for good, and also for harm, therefore the physician who undertakes to treat patients by means of this agent must not only know his tools but he should be well grounded in his principles of diseases of the skin, the clinical characteristics, and the principle causes.

There are two schools that hold diametrically opposite views as to causation. One teaches that all diseases of the skin are due to external irritants, while the other holds that all skin diseases are of internal origin. Much scientific research has been done in late years that would lead to the assumption that neither school is correct.

The x ray is perhaps the most potent remedy in the treatment of dermatological diseases. A few words as to the history of the x ray may not be amiss. It was discovered in November, 1895, by Professor William Conrad Röntgen. The discovery was accidental, but without previous investigations on part of various physicists, the accident would not have occurred. Abbe Nellet experimented in the eighteenth century, passing a high potential current through a glass bulb, and succeeded in illuminating it. In 1859 the Geissler tube was constructed. The next important landmark was the discovery of the Crookes tube. In 1895 Röntgen was actuating a Crookes tube enclosed in a cardboard box when he noticed that some crystals of platinocyanide of barium laying at some distance fluoresced. He then placed various objects between the source of radiation and the barium salts and soon found that the invisible radiation would penetrate any material in accordance with its density. He named this radiation x ray. He then devised the fluoroscope; with an astounding rapidity the scientific world recognized the importance of the discovery and soon it was utilized in medicine for fractures, locating foreign bodies, and other purposes. Soon after it was discovered that prolonged exposure to x ray causes erythema.

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*Read before the Medical League of Philadelphia.

Only a month or two after Röntgen announced his discovery Shiff and Fround suggested its use in the treatment of disease. But a short time passed when it became hailed as a cure all. Tuberculosis, cancer, and many other chronic diseases were reported to be an easy prey to those omnipotent rays. It was only after some patients and many physicians had been seriously injured, while others even paid with their lives, that a reaction took place. For a while it appeared as if x ray as a therapeutic agent would be relegated to oblivion. With the development, however, of instruments of precision, perfection of technic, by which danger to patient as well as to operator is almost eliminated, x ray therapeutics is again coming to the front. Especially has it proved its value in cutaneous affections.

Thus tracing briefly the progress of x ray, it would be unfair to omit the names of the two most important American discoverers. I refer to Snook of Philadelphia, who introduced the interruptless transformer, and Coolidge who introduced, in 1914, the Coolidge tube, the latter marks a distinct epoch in röntgen therapy.

It has been mentioned that x ray is the most potent remedy in cutaneous diseases. It behooves us now to analyze and see by virtue of what it is so effective.

1. The x ray possesses chemical action. It has the power to alter elementary substances as well as simple organic and inorganic compounds, the change being due to oxidation.
2. Biochemical action: A number of investigators have shown that the x ray can modify the production and action of enzymes and ferments.
3. The x ray has a bacterocidal power.
4. Minute amounts of radiation stimulate, while large amounts inhibit and destroy.
5. Cells that are undifferentiated, immature, biologically or physiologically active are most readily influenced.

We will now pass to the actual conditions or diseases that are favorably influenced or even cured by the medium of x ray. Of course here it is not the place to detail the technic nor to go over all the diseases of the skin.

ACNE VULGARIS.

Acne vulgaris is a common disease of adolescence. It is troublesome, and often disfiguring. I think many of you will testify that drugs have proved of little avail, in spite of some of the dermatologists' views to the contrary. Were I asked to choose one agent, with which to treat acne, I would unhesitatingly decide upon the x ray. It is superior to all lotions, salves, and vaccines. Many dermatologists consider it a specific, and in the great majority of cases the cure is permanent. Ten to sixteen fractional doses will usually effect a cure.

SYCOSIS VULGARIS.

Here the results of x ray treatment are not constant. In some cases of years' standing a few exposures have accomplished brilliant results, while in others it failed to cure. Sycoses, however, being an obstinate condition and refractory to drugs, it is well and advisable that every patient be radiated, and other measures such as vaccine and tonics, should not be neglected.

FURUNCULOSIS.

The x ray is of great value in the treatment of recurrent boils in any given area, a few exposures often prevent the development of new boils. There are cases on record where remarkable results have been obtained in carbuncles.

TINEA TONSURANS.

Ringworm of the scalp is much more common in Europe than in the United States. In Paris they have ringworm schools. Nevertheless, it is quite common here, especially in our large cities and poorer districts. Caused by a fungus it is communicable and may be contracted from domestic animals. Ringworm of the body is comparatively easily cured, but the same disease of the scalp is refractable to drugs. To treat successfully a case of tinea tonsurans by local applications requires a great deal of labor, patience and intelligence on the part of parents and physicians. Fortunately we have now a ready means to cure this disease in a short time. Depilation of the entire scalp cures all cases. The fungus inhabits the hairs, and when the hair falls the organisms are removed from the follicle.

In 1904 Sabouraud and Noire devised a method of depilating the entire scalp in one sitting by means of the x ray. This method, while a great boon for the sufferers, required four hours of exposure. Kwinbock devised a new technic which Adamson modified, and now by the Kwinbock-Adamson method depilation of the entire scalp can be accomplished in about half an hour. Of course a great deal of skill is presupposed on the part of the operator. Permanent alopecia may result if an improper dose is given. Ringworm of the scalp is a disease of childhood.

FAVUS.

Favus is also a disease caused by a fungus and unlike ringworm of the scalp, attacks individuals of any age. Favus is rare in American born people. Favus of the scalp is even harder to cure by means of drugs than tinea tonsurans. The x ray accomplishes the same results in favus as in ringworm of the scalp.

TINEA BARBÆ.

Ringworm of the beard is likewise cured by the same means, the technic being somewhat different.

ECZEMA.

The conception that the term eczema conveys today is different from what it did some years ago. Modern writers on dermatology classify a number of conditions that were formerly considered as eczema, as distinct and separate entities. In a general way it may be stated that eczematoid conditions, caused by external irritants, are classed as dermatoses, while those of internal origin are said to be true eczema.

You may readily see that eczema embraces a great variety of skin conditions. Should I attempt to describe the various forms of eczema, that do or do not respond favorably to x ray, a treatise on diseases of the skin would have to be written. I will, therefore, content myself with stating that nearly all forms of eczema are favorably influenced by irradiation; that whenever cause may be found it should be removed, if possible; that wherever the condition is acute and inflamed x ray should be withheld; that not infrequently the results are spectacular and permanent; that on the other hand recurrences are not uncommon; that along with x ray other methods should not be neglected.

PSORIASIS.

Lesions of psoriasis respond readily to irradiation. Unfortunately recurrences are common. For cosmetic and other reasons, when the site of the lesions are on face or hands, it is well to use the rays as the psoriatic patches disappear rapidly, and in the meantime other methods may be used to ward off relapses if possible.

PRURITIS.

It is doubtful whether x ray is of value in general pruritis. But in regional pruritis it is of distinct value. A course of ten or more exposures will often alleviate and cure the most obstinate cases of pruritis ani, pruritus vulvæ, or both, when not caused by diabetes.

TUBERCULOSIS.

The tubercle bacillus is very resistant to the x ray.

Tuberculosis of the skin and allied conditions are not favorably influenced by the x ray.

LUPUS VULGARIS.

In earlier years the x ray was highly recommended for the cure of lupus. Today dermatologists speak with hesitancy, except in the ulcerative type. In lupus erythematosis nearly all agree that it is of no value. In tuberculosis orificialis it yields good results, but there are great technical difficulties. Scrurufolodonua is a disease of this group, which is favorably influenced by radiation and often cured. Erythema induratum and sacroid are also reported to give good results on irradiation. Tuberculous adenitis, though not strictly a skin condition, yet may be included here. Röntgen rays do cure a large percentage of these cases, while in others the glands are calcified and greatly reduced in size. One should hesitate to operate on these cases when such brilliant results are obtainable by the rays.

VERRUCA.

Warts respond very readily to the rays. Multiple warts can thus be removed without leaving scars and without pain.

SENILE KERATOSIS.

Are frequently the forerunners of malignant growths, and should therefore receive serious consideration. One or several exposures of x ray will remove them.

NEVI.

This group of skin blemishes are, as a rule, not satisfactorily treated by the rays, though some röntgenologists persist in its application. The cavernous type being the exception.

BENIGN NEW GROWTHS.

True keloid as well as hyperophic scars, which have been considered as incurable conditions, respond favorably to the x ray. Young and small keloids invariably disappear under the rays, not to recur again, while larger and old keloids may have to be excised by the knife followed by x ray. They will not recur as they would invariably do otherwise.

RHINOSCLEROMA.

The most troublesome and disfiguring condition of the nose and upper lip is curable by the rays. So also is dermatitis papillaris, capilliti, or acne keloid.

Last, but by far not least (perhaps the most important group of conditions as far as life is concerned), are the malignant growths of the skin.

EPITHELIOMA.

As early as 1899, Stenbeck of Stockholm had successfully treated a case of epithelioma with x ray. Since then the literature has been prolific with reports of marvelous results. Today nearly all cases of epithelioma are classified into two varieties: Basal cell epithelioma and prickle cell epithelioma. The basal cell epithelioma has its cite of predilection, the face, eyelids, nose, and temple. The prickle cell epithelioma plants itself preferably on the mucous membranes of the tongue, lips, or at the junction of skin and mucous membranes. The last named is by far the more malignant.

All röntgenologists agree that the basal cell epithelioma is comparatively easily cured by the x ray. Modern technic has been so perfected that from one to ten exposures cure nearly ninety per cent. of the cases. McKee, of New York, reports with detailed statistics 421 cases clinically cured, of which 139 did not remain under observation for six months, while 282 cases were observed for periods of from six months to nine or more years. Of these there were only thirty-six relapses, some of these were again healed under the influence of the x ray. Many others report similar results, namely ninety per cent. cured. There being no pain, no shock, nor inconvenience, and the cosmetic results being much superior to those obtained by any other method, surgery included. Röntgen rays should therefore be the method of choice. Only when it fails the patient should be subjected to the knife or some other method.

PRICKLE CELL EPITHELIOMA.

Here the results are not so favorable, because metastases are very likely to take place. If the lesion is young the x ray will cure, but the well developed cases should be thoroughly eradicated by the knife to be followed by x raying for prophylactic purposes as well as to destroy malignant cells that may have remained *in situ*. Even in these cases many prefer the x ray unless the lesion is on the tongue.

PAGET'S DISEASE.

Various writers have reported good results in the treatment of Paget's disease with the x ray.

SARCOMA.

Cutaneous sarcoma is not a common condition. The reports as to the value of x ray in this condition are contradictory. Brilliant as well as disappointing results have been obtained. There are a host of other skin conditions in which the röntgen rays are beneficial and often curative, but I shall not touch upon these. It is to the more or less common skin diseases that I have restricted my paper.

SUMMARY.

1. The x ray is the most potent factor in the treatment of skin diseases, and by far the most valuable single agent we possess.

2. Röntgen rays have long since passed the stage of empiricism. We now know their chemical, biochemical, bacteriological, physiological, and embryological action. Thus having a scientific knowledge of their power, we can intelligently judge and even predict the results.

3. Apparatus and technic have been so perfected that the units or fractions thereof administered to patients are extremely accurate. X ray burns should be a thing of the past.

4. The x ray is a useful agent in nearly every disease of the skin. In some it will only alleviate symptoms, and may prolong life as in mycosis fungoides, in others it will cure only temporarily, as in psoriasis, and some forms of eczema, while in other conditions it will cure permanently as in acne, epithelioma, sycosis, ringworm, and others. In the malignant forms of epithelioma it is the only agent we know of acting as a prophylactic. The x ray, therefore, should be resorted to more often than it is today to alleviate human suffering.

322 SOUTH SIXTEENTH STREET.

The Tungsten Incandescent Electric Lamp Used as a Therapeutic Agent

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This paper will confine itself to the therapeutic value of the tungsten filament electric lamp of from sixty to one hundred watts and 110 volts. The carbon filament electric lamp must not be confused with it as the carbon filament lamp has extremely different properties. Inasmuch as the therapeutic properties of the tungsten filament electric lamp depend upon radiant energy it may be permitted to preface with a brief exposition of the present ideas concerning radiant energy.

The energy of the entire universe is in its last analysis, and has for its primary manifestation vibration.

The source of this vibration is theoretically explained as the motion of electrons, atoms and molecules. These motions are of two types or orders, orbital or tangential, in direction, and produce varying spherical vibrations or waves in the ether expanding from the point of energy emission as a centre. These vibrations are either directly distinguishable by our organs of sense or indirectly detectable by special instruments. The following is a table of vibrations whose existence is manifested by work done or has been mathematically deduced:

	No. of vibrations a second
Mechanical vibration	
1st Octave	2
2nd “	4
3rd “	8
Sound	
4th “	16
5th “	32
6th “	64
7th “	128
8th “	256
9th “	512
10th “	1,024
15th “	32,768
Unknown	
20th “	1,047,576
Electricity	
25th “	33,554,432
30th “	1,073,741,824
35th “	34,359,738,368
Unknown	
40th “	1,099,511,627,776
Heat	
45th Octave	35,184,372,008,832
46th “	70,368,744,177,664
47th “	140,737,468,355,328
Unknown	
48th “	281,474,976,710,656
Light—Chemical Rays	
49th “	562,949,953,421,312
50th “	1,125.899.906,842,624
Unknown	
51st “	2,251,799,813,685,248
57th “	144,115,118,075,855,872
X Rays	
58th “	288,230,376,151,711,744
59th “	576,460,752,303,423,488
60th “	1,152,921,504,606,846,976
61st “	2,305,843,009,213,693,952
Unknown	
62nd Octave (and beyond)	4,611,686,018,427,387,904

It may be thoretically admitted that nothing in the universe is absolutely motionless since space is everywhere traversed by radiant energy. Except for our own sun, however, the other sources of radiant energy are of little or no significance to us. All life on our planet is absolutely dependent upon the sun for constant supply of radiant energy (which lies somewhere between the limits of the twentieth and fifty-first octaves.

PHOTOTHERAPY.

Medical science lays this source of energy under contribution and calls it phototherapy. Not only is the natural sunlight used (heliotherapy) but the several colors of which its spectrum is composed are used severally or in combination by means of colored lenses or artificial sources of light giving out colored rays (chromatotherapy) as well as the invisible rays just below and just above the visible spectrum which we speak of as infrared or heat rays and ultraviolet or chemical rays.

RADIANT ENERGY.

It is necessary to make a distinction for therapeutic purposes between radiant energy which usually connotes the above and radio energy which is confined in medicine to the shower of helium atoms and electrons given off from radioactive elements, the cathode shower from the Coolidge tube and the röntgen or x rays caused by the deflection or stoppage of these showers by the anticathode or the living tissues and again radioenergy as meant by the users of radiotelephony, radiotelegraphy, and wireless power transmission. There is a wide distinction between radiant therapy and radiotherapy not alone in term but actually in means employed and results to be obtained.

COLORED LIGHT.

Natural or sunlight we speak of as white light. It represents the aggregate of all the vibrations of which it is composed which range from far down in the invisible heat rays up through the visible spectrum and on into the invisible rays beyond the violet.

The visible rays in sunshine are called colors when separated into the spectrum and thoretically there is a shade for every wave length but science has not been able to separate a single wave, monochromatic color. It has, however, measured the wave lengths of the prominent spectral colors. The following table gives the wave lengths corresponding approximately to the centre of each color in the spectrum measured in ten thousandths of a millimetre:

Red	....0.0007 mm.
Orange	.0.00059 mm.
Yellow	..0.00052 mm.
Green	..0.00052 mm.
Blue	....0.00049 mm.
Indigo	..0.000438 mm.
Blue	....0.0004 mm.

Color bears the same relation to light that pitch does to sound and white light may be compared to a piano with every string vibrating at once and continuously.

In artificial light some of the wave lengths are feeble or absent and as penetration of living tissues by radiant energy depends upon the wave lengths as well as the density of the tissues and the distance of the source of light from the part irradiated and as the heating effect in the tissues is inversely as the wave length the character of the lamp or light source will materially affect the therapeutic as well as the physiological result. Again as light is refracted as well as absorbed it is essential that the light fall upon a part under treatment at right angles to the surface to obtain the maximum penetration.

The tungsten filament lamps as compared with sunlight, the arc light or the mercury vapor lamp are very deficient in the socalled actinic or chemical rays of the upper half of the spectrum and absolutely lacking in ultraviolet rays which in sunlight have such a profound effect upon cellular physiology. (The glass bulb obstructs the passage of wave lengths above thirty microcentimetres in length). These lamps are, however, relatively rich in the lower half of the spectrum from green to infrared which frequencies arise not only from the filament itself but also from the glass globe and the reflector which convert the higher visible frequencies into the lower and slower invisible heat rays.

The therapeutic value of these lamps depends directly upon the penetrability of living tissues by their radiant energy which in turn depends upon the wattage. It has been demonstrated that light will penetrate even bone, and pictures have thus been taken through the thickness of the living hand. We are all familiar with the transillumination of the facial sinuses by light in the mouth and also of the abdomen by light within the bladder, vagina or rectum. It is used in the diagnosis of hematocele and we are all able to see the sunshine through the hand or the ear lobe.

The light which penetrates lies in the red end of the spectrum because the higher frequencies are stopped and absorbed by the skin and blood in the cutaneous capillaries. These lamps are therefore physically suitable for therapeutic action.

When the orange, red, and infrared rays penetrate they are converted into heat rays directly within the cells. The skin is a poor conductor of heat rays and of the ultraviolet rays, especially when tanned or pigmented, but it is a good conductor of cold and of radiant energy. The skin is designed to ward off heat not cold; cold is combated by another mechanism.

Herein lies the essential difference between the heating effects of radiant energy and convection heat; in the one the radiant energy penetrates deeply and is converted into heat directly in the cells of the deeper tissues, while in convection heat as applied by hot air, vapor, hot water, hot mud, and other agent, the skin stops the heat rays and transfers it to the blood in the surface capillaries which carries the heat away.

The physiological response to light may be general, regional or local according to the method of administration, and slight or profound according to the wattage or illuminating power of the luminous source. The following is a brief outline of the effects noted when the body is illuminated by tungsten lamps:

a. The cutaneous nerve ends are stimulated to send messages to the vasoconstrictor centres of the cord whereby there is an increase of blood pressure and a consequent flushing of the cutaneous capillaries (result erythema).

b. The flushing of the cutaneous capillaries brings cooling blood and what is also most important an additional supply of potential energy in the shape of dissolved food, endocrine secretions, and oxygen (result fever).

c. The heated blood is rapidly drained away by the dilated veins and lymphatics thereby cooling the area affected and raising the temperature of the blood in the rest of the body as well as removing waste products of increased cellular metabolism (result increase of bodily temperature, and decreased urinary solids).

d. The sweat and sebaceous glands are stimulated and secrete actively, their products forming a protective film on the skin and causing an immediate cooling by evaporation (result heat regulation).

e. The red blood cells absorb the chemical rays whereby they give up oxygen more readily in the form of adrenoxydase (result metabolism increased).

f. The blood stream is rendered slightly fluorescent by the chemical rays (result the blood is germicidal).

g. No pigment is formed in the skin so no tanning or sunburn results, therefore there is no obstruction to the full absorption of the light energy (result deep therapy).

h. There is no blistering or desquammation so the rays are not lethal to protoplasm unless high wattage one hundred K. W. lamps be closely applied.

i. The increase of blood pressure increases the work of the heart and slows the pulse (result a quieting of nervous states).

Phototherapy with tungsten lamps, according to this action, is indicated in wherever we have acute conditions causing I, an interference with free access of blood and lymph to the cells, and II, an obstruction to drainage from the cells because these two conditions are the fundamental and initial causes of cellular debility and death no matter what tissue is affected or what name we choose to apply to the symptoms.

THERAPEUTIC APPLICATION.

These lamps may be arranged for general, regional or focal irradiation. General irradiation or the incandescent light bath is administered by from fifty to eighty incandescent lamps within a well ventilated cabinet whose walls need not be highly reflecting.

The patient is exposed naked or clad in light drawers to this illumination preferably lying on a glass slab or he may sit on a stool. The head remains without the cabinet and is enveloped in a towel wrung out of cold water, or if it be a woman by an ice cap or a cold Leiter coil. The patient should drink freely of cool water while in the cabinet. The temperature, weight, blood pressure, sitting and lying should be noted and in certain special cases a basal metabolism reading, a blood specimen taken for chemical and microscopic examination and a urine specimen also. The same examinations should be made for comparison after the bath as were made before it.

With debilitated or depressed patients the lamps should be turned on seriatim after entrance as sudden complete illumination can cause shock.

Two general effects are to be expected from light baths: a, tonic effect; time of irradiation being from three to five minutes; b, an eliminative effect; time of irradiation from fifteen to thirty minutes.

The length and frequency of the bath as well as the intensity of the illumination must be left to the judgment of the physician in every case, but as a general guide daily treatments may be given for the first three to five treatments and after that twice or once a week for about three treatments according to the results.

Immediately after the light bath the patient should be sponged off or showered with water at a temperature of 85° F., and if very weak immersed in a tub or wet pack. In robust subjects a Scotch douche or a cold plunge with a few moments' swim is very beneficial especially if followed by a gentle rubbing. Whenever possible the patient should be allowed to lie down for a while when he will fall into a refreshing slumber. Precautions against chilling are essential.

PHYSIOLOGICAL ACTION OF LIGHT BATHS.

Skin.—The effect of these baths on the skin is twofold; directly from the heat rays of the bulb and the walls of the cabinet and indirectly through the action of the radiant energy on the vasomotor system, raising the blood pressure and flooding the surface capillaries with blood which increases the surface temperature and increases the work of the sweat and sebaceous glands. The amount of perspiration in a light bath is not dependent upon the heat of the contained air because the amount of perspiration in a light bath whose temperature is 81° F. is about twice that in a Turkish bath at a temperature from 140° F. to 148° F. and is by no means so exhausting. If the temperature in the light cabinet is raised by increasing the number of lamps, closing the ventilators and if the patient be given hot drinks he may be made to perspire a quart in about twenty minutes. A still greater amount of heat may be obtained by using carbon filament lamps but the tonic effects of deep irradiation are nil with these lamps.

The perspiration will show a characteristic elimination by giving strong odors indicative of drugs such as tocacco or alcohol or of substances resulting from intestinal absorption and other unoxidized toxins. Even sulphur, mercury and other chemicals the result of occupational absorption will be found in the perspiration. In toxemias the elimination is rapid and the improvement prompt. The erythema lasts for some hours as a pleasant glow. There are no desquammation or tanning.

Cardiovascular.—There is an immediate rise of blood pressure of moderate amount which causes an increase of force in the heart beat with slowing of the pulse. There ensues directly a capillary engorgement not only of the skin but of all the organs, thereby equalizing the blood volume in general but engorging the organs which tends to increased metabolism. Therefore epistaxis and increase of the menstrual flow are noted. Continued excessive illumination causes marked dehydration of the blood and consequent decrease in volume with irregular pulse and sense of faintness unless the loss is made up by drinking freely of water while in the bath.

Blood.—The blood serum fluoresces under the blueviolet end of the spectrum which also is absorbed by the oxyhemoglobin thereby increasing the liberation of oxygen as adrenoxydase. The red and white cells are actually increased from ten per cent. to twenty per cent. and an increase in polymorphonuclears and mononuclears is noted about an hour after irradiation. There is no hemolysis with these lamps, but if excessive exposure is suffered the complimentary power of the serum is decreased and ferments are weakened or destroyed. Further work is indicated along this line of blood chemistry.

Respiratory exchange.—The respiration rate increases but remains shallow while in the bath, normal conditions being resumed after it. The excretion of carbon dioxide is increased from one per cent. to four per cent. which is less than in a Turkish bath where an increase up to eleven per cent. has been noted.

Renal excretion.—The increase of elimination of liquids and solids by the skin and lungs reduces the urine output temporarily. There is a field for study here as to whether there is a qualitative change as well.

Temperature reaction.—While there is some direct heating of the blood in the surface capillaries during the bath due to the heat rays from the glass globe there is a greater and more immediate response to the deep heating by the tissue absorption and conversion of the radiant energy and the increased metabolism from oxygenation so that within about twenty minutes the temperature by rectum may rise four or more degrees.

Body weight.—Depending upon the condition of the patient, the duration and intensity of the irradiation there is as noted active metabolism, removal of wastes by lungs and skin, and pronounced perspiration which loss is compensated by draughts of water during the bath. In the tonic bath there is an improvement in appetite and digestion so that persons of spare habit may put on flesh and stout persons become stouter. By using the eliminative bath, however, for obese patients a permanent fall in weight may be obtained provided it is done judiciously and with due regard to a diet of reduced calories. It is necessary that care be exercised by the physician in obese patients who are anxious to reduce not to attempt too rapidly a reduction because the process of reduction consists of an oxidation of the adipose tissue and we would have the blood and lymph so loaded with oxidized and partly oxidized products of fat combustion as to overtax the emunctories and cause uremic symptoms. The odor of the breath is a prompt indication of such surfeit.

Nervous effects.—Due to the initial capillary congestion from the vasoconstriction we have cerebral hyperemia causing in some subjects vertigo, headache, and throbbing. For these symptoms is the precaution of the icecap or cold wet towel to the head while in the bath. This condition lasts, however, but a relatively short time, being relieved by free perspiration due to the withdrawal of water from the blood together with the reduction in toxic materials and the mind is clarified, a feeling of well-being supervenes and later due to a reduction of blood quantity and cerebral anemia, drowsiness supervenes.

In the sympathetic system we find a marked diminution of irritability following upon the reflex vasoconstrictor action and the removal of toxins from the blood together with an increased supply of adrenoxidase and food.

Appetite and digestion.—There is a general stimulation of the entire digestive tract due to increased blood supply from the general capillary congestion; appetite and digestion are both augmented and the intestinal elimination is benefited, constipated habits being overcome. As a result weight is put on and in stout persons this must be guarded against.

Bactericidal action.—There is but slight direct bactericidal effect from the tungsten lamp owing to the absence of ultraviolet rays and the paucity of blueviolet rays, but there is a decided indirect bactericidal effect upon infected parts due to the increased supply of blood to the focus which is Nature's own antiseptic, an increased virility of the affected cells due to the same source of succor and a slight fluorescence of the blood serum which is germicidal. When specific germicides such as the antisyphilitic drugs are administered the lethal effect of the drug is heightened and the cure augmented. In chronic or cachetic states or where the infection is disseminated general illumination is harmful. Skin infections do not do so well as under blue or ultraviolet light alone and the exanthemata do not do well, are made worse by illumination unless all rays above the orange are excluded. In such cases semidarkness being just as advantageous as red light for smallpox and scarlet fever patients since the object is exclusion of the higher light frequencies which are irritating to the skin.

INDICATIONS FOR THE LIGHT BATH.

Based upon the physiological reasons given the following conditions are assisted by this form of treatment:

a. Lowered nutrition, altered endocrine balance, acidosis, ricket osteomalacia, etc.

b. Conditions of suboxidation as obesity, lithiasis, gout, rheumatic joints, diabetes, myositis, etc.

c. Altered blood picture essential or secondary as anemia, chlorosis, malaria, etc.

d. Nervous conditions due to faulty metabolism or altered functions of other than cerebral cells, hysteria, paralysis following acute anterior poliomyelitis or diphtheria or lead poisoning, tabes, toxic insanities, neuralgia and neuritis, insomnia, psychasthenia and neurasthenia.

e. Respiratory congestion, inflammations and altered function as asthma, bronchitis, pneumonia (in the beginning stages) and incipient tuberculosis.

f. All condition connected with sluggish blood stream where congestion is the marked feature of the complaint as hepatic and splanchnic and coronary congestion, varicosities, gangrene and vasoconstrictions of toxic or neural origin, threatened apoplexy and right heart embarrassment.

g. All kidney conditions where reduced urine output threatens life.

h. Ulcers, wounds and trophic impairment of tissues and to aid wound repair, graft union and reduce scarring.

i. Osteomyelitis and periosteitis.

j. Toxemias due to faulty elimination, occupational absorption, drug habits, intestinal stasis, etc.

These are given as general indications without going into details.

REGIONAL OR CANOPY INCANDESCENT LIGHT TREATMENT.

When we are desirous of affecting a focal point of pathology it is often very advantageous to invoke the aid afforded by the physiological stimulation of adjacent tissues and in these cases the tungsten lamps are used in groups or clusters, with or without reflectors as desired. For example, a number of lamps are connected in series on an extension cord for attachment to a lamp socket or wall plug. The group is then suspended from the arches of an ordinary bed cradle over which is thrown a sheet for a reflector. A piece of tin, cut and bent, to cover over the cradle would improve the reflection. The amount of irradiation can be controlled by screwing or unscrewing the lamps in their sockets. Reflectors increase the heat waves.

The regional light application is useful in circumscribed areas of tissue stasis or leakage or of inflammation, particularly traumatic inflammation as contusions, exudations, sprains, inflamed joints, pleurisy, lumbago, neuralgias, chronic ulcer, indolent or infected wounds, grafts, and scars. The essential value lying in continuous application of the light for extended periods or until improvement is as assured or cure obtained which may take days and in some cases weeks. In such case provision must be made to prevent discomfort from long continued posture and the depression that would come from too free perspiration as well as to guard against bed sore formation. The light must always fall upon the bare skin which is near enough to be comfortably warmed. Ventilation of the cradle is essential and an electric fan can be used but not if the surface be perspiring.

LOCALIZED FOCAL IRRADIATION.

As with the regional or canopy irradiation the essential value of focal illumination with tungsten lamps lies in long continued application. A single bulb sixty to one hundred watts and 110 volts with a suitable reflector as with an ordinary drop light or desk lamp serves the purpose, that is unless we are treating a special part such as the nose, pharynx, ear, uterus and vagina, rectum or bladder where lamps of special design combined with specula are required. Such conditions as boils, mastoiditis, lumbago, infected wounds or contusions and sprains, inflamed eyelids, ulcers, etc., are favorably affected by the ordinary commercial bulb.

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Ray Treatment of Cancer

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CANCER—SURGERY—RÖNTGEN RAYS—RADIUM—AND ELECTROTHERMIC COAGULATION.

I shall not enter into any description of cancer in its various forms and locations upon or within the human body. Physicians are familiar with the disease and more complete and better classifications can be found elsewhere than could be given here. Suffice it to say that no single method of present day treatment has been found one hundred per cent. perfect in all cases and that such treatment will probably not be found until someone actually finds the real, true cause of this dread disease. It may be that were the cause actually known, we would still be unable to lay our hands upon one treatment that would completely and permanently cure all cases. It is equally well known that up to the present time the cases have been treated, most of them by surgery alone, some by surgery and radiation therapy combined, some by radiation therapy alone, and a few by electrothermic coagulation, either alone or combined with radiation therapy. Also it is well known that the mortality is high when any of the methods mentioned are used alone, that it is lowest when all are used in proper combination, and that of all agents used singly, radiation therapy is the best when properly done.

If I had an operable malignant growth I would most certainly allow myself whatever benefit an operation could give, providing I could also have preoperative and postoperative prophylactic radiation therapy. By an operable growth I mean one that has been discovered early, has not yet metastasized, is freely movable both in its bed and underneath the overlying tissues, has not ulcerated or produced necrosis of the overlying tissues. For instance, I should hesitate to advise operation in a growth of the breast that has metastasized to the axilla, no matter how small the nodules felt may be, unless all metastatic nodules disappear under radiation. Lymphatic drainage is at least as free into the mediastrium and to the opposite breast as to the axilla, therefore it seems reasonable to suppose that a case showing axillary metastasis also has metastasis within the chest. If the cases showing no signs of metastasis externally are carefully examined with the röntgen rays, sometimes it will be found that there is already mediastinal thickening and infiltration. Such a case is, in my opinion, inoperable. If operated it would be more difficult to keep such a case well with postoperative prophylactic radiation than if the case had not been operated upon at all. From this discussion it is easily seen that I am a most firm believer in surgical removal for cases that are operable, when combined with radiation therapy skillfully carried out. I also believe that most of the operative failures occur in the cases that are not really operable.

Patients that have been operated upon with metastasis or recurrence or both as the end result should not be operated upon again. All surgeons and radiotherapists agree that further operation in such cases usually hastens the end. How can surgery hope to succeed when the disease is widespread when it was unable to produce a cure when the disease was more localized than after metastasis or recurrence?

If a malignant process within the lymphatics can be made to disappear and not reappear the patient will not die of cancer. Once the general lymphatic condition is under control the local or primary growth, if it has not already disappeared, is usually operable and can be efficiently treated with surgery. Upon our ability to eradicate malignant disease from the lymphatic system or to prevent it ever from getting there, depends our ability to cure malignancy. To my mind there is only one way to do this, perhaps not a perfect way just at present, but vastly superior to any other method or methods that have stood the tests of time. Particularly is this true since most of us are now using a newer technic for deep röntgentherapy.

When using the röntgen rays we have practically an unlimited supply of radiation. We can apply a million times as much radiation in the same length of time as can be applied with any other agent not accepting radium. Therefore for general raying, for raying of the lymphatics around the diseased part, crossfiring as much as possible to the disease, to seal the surrounding lymphatics before operation, so that at operation there can be no metastasis through open lymphatics, the röntgen rays have first, and in my mind, the only call. This opinion is not altogether my own. Not long ago at a meeting of radiotherapists, a most interesting and instructive paper was read. At the end the reader reported his results and it was found that many patients were dying of the very disease for which they sought treatment. In the discussion Dr. Pfahler reported that for the type of malignancy under discussion, cancer of the lip, he had yet to have one death due to the disease. They had all been cured permanently. Radium was used for general raying as well as locally with a high mortality rate. Dr. Pfahler used the röntgen rays generally and locally and followed by burying radium locally or better, when possible by destroying the actually diseased area by means of electrocoagulation. Both men got their cases well locally but in many of the reader's cases metastasis and death from cancer developed.

The new röntgen technic is doing more than we even dared hope a few years ago. I believe that the insertion of radium into, or placing it upon, malignant tissue whose surrounding lymphatics have not yet received an efficient röntgen radiation at least a week before such radium treatment is given, is wrong. Dr. Russell Boggs has expressed himself as being of the same opinion. When possible I prefer to allow even more time before the local use of radium is begun. Since the use of the new röntgen technic began I have discovered that not infrequently when the supposed time for the local use of radium arrived there was no need for it. The disease had entirely disappeared, or was in such condition that it was felt that it would be wiser to have the actual disease removed surgically, or by electrocoagulation when possible, or to continue with the röntgen rays alone. If we are going to advise preoperative radiation I believe we should advise preradium radiation. By surgery we actually remove the disease, with radium we destroy the disease *in situ.* The indications for protection of the surrounding lymphatics are at least equal in either case. The need for protection of the surrounding lymphatics is greater following destruction by radium than following removal by surgery.

Röntgen radiation is at present a standardized method of treatment when properly done. It is not easy to give radiation therapy properly, particularly röntgen radiation. Today we can gauge our doses just as accurately as the physician gauges the dose of a drug. But to do this we must plan carefully in each given case, we must do hard work, and we must use the agents at hand skillfully. It is an easy matter to get our doses just right when the lesion is on the surface, but when the cervix or the uterus, for instance, is the seat of the disease we are face to face with a perplexing problem. The problem is, how are we to get sufficient medication to the disease to destroy it? We cannot put through any one area of healthy tissue more than one erythema dose as registered upon the skin. We will suppose that we are dealing with a malignant cervix. Before starting the radiation, in order that we may be sure to give the cervix a cancer knockout dose rather than a stimulating dose, we must measure our patient's pelvis, front to back, side to side, cervix to abdomen, cervix to back, and other measurements. Our measurements have shown the growth to be ten centimetres from the surfaces. With certain established treatment factors the iontoquantimeter shows that at a depth of ten centimetres we only have left of one hundred per cent. on the skin, thirty-one per cent. This is due to the filtering and absorption of the rays while passing through the overlying tissues. A cancer knockout dose is one hundred per cent. of an erythema dose counting both primary and secondary radiation, i. e., a dose sufficient to give an erythema of proper degree upon the skin. Treating through four areas in this case will give us the correct knockout cancer dose, providing we get our tube at just the right angle to produce a perfect crossfire. Our treatment factors must be just right to produce an erythema over each area, our tube must be at the proper distance from the skin to insure a proper depth dose in a given case. Filtration must be of proper kind and thickness for the voltage used, and we must know our machine, otherwise we will fail. For instance, in my own case, there is a difference of three minutes between my two machines, both are of the same make and capacity. Furthermore, if for any reason we are unable to get the proper depth dose to the cervix with the röntgen rays, we must make up the difference from within the cervix with radium. Our radium also must be calibrated or even now we may fail to get the cancer knockout dose. Radiation therapy carried out by any other method can result in nothing but failure unless by accident we get our doses just right.

Radium is the most powerful and most destructive form of radiation that we have, but since we are so limited in quantities of radium radiation, I believe that we are not justified in using this agent except in combination with the röntgen rays. Between series of röntgen radiations we can to advantage bury radium, either in the form of needles or emanation, throughout the primary growth itself as well as into any metastatic nodules that lend themselves to such treatment. In the pelvis it is impossible to ray the parts with a homogenous radiation with sufficient intensity with radium alone. If we are to stand any chance of getting our patient well we must get a homogenous radiation of proper intensity to every tissue within the pelvis. The limit of doses within the pelvis with radium are determined by the affect upon the nearby organs' i. e., the bladder and the rectum. In any case we dare not leave a fifty milligram capsule of radium filtered through one and a half millimetres of brass and rubber for more than fifty hours. This will give us a homogenous radiation of sufficient intensity for three centimetres from the capsule, i. e., for only three centimetres with radium can we destroy malignant tissue. Beyond this the radium rays, like the röntgen rays when they are not homogenous or are of insufficient intensity, are stimulating and in the end would do more harm than good unless the required intensity of radiation is made up with the röntgen rays. With larger amounts of radium than those mentioned, exposure time is shortened, the dose and intensity of radiation being the same. It is not safe to go beyond 3,500 milligram hours in any case for fear of irreparable injury of the bladder and rectum. Radium possesses practically unlimited powers for good when employed with a thorough understanding of the physics of radiation therapy but as generally used up to the present time I fear that at best only temporary relief is being obtained, perhaps at the expense of future benefit in a given case.

ELECTROTHERAPY.

Electrothermic coagulation is a method of treating certain forms of malignancy, or certain localities, that have become affected with malignant disease. Until recently it is a method that has not been popular with many of us. When possible it is good practice, after preliminary röntgen radiations, to remove local manifestations of the disease by means of electrocoagulation. Electrocoagulation has several advantages over any other method, some of which are: At no time during the operation are the lymphatics or bloodvessels opened. The same current that coagulates or destroys the tissue seals the lymphatics and bloodvessels. Because of the former there is less chance for metastasis and because of the later the operation is bloodless. During the operation of electrocoagulation we must make sure that we destroy all of the disease. We must coagulate well out into healthy tissue. The coagulation should in fact begin in the healthy tissue, the diseased tissue being destroyed last. When the coagulation is completed, to lessen the sloughing we may at once remove the diseased tissues by cutting them away, always keeping well within the coagulated area, or we may allow the whole to slough away itself. This operation is not particularly known for its power for beauty but in cancer we are dealing with questions of life and death.

This is one of the most efficient, if not the most efficient, method for removal of malignant tissue without subsequent recurrence or metastasis or both known today and it is unfortunate that all localities affected by malignancy cannot be treated by this method. However, one is at once struck by a surprisingly good cosmetic result following so much destruction.

Electrocoagulation can be used to advantage in leukoplakia, cancer of the tongue, epitheliomata, by suprapubic cystotomy for cancer of the bladder, malignant tonsils and other locations within the mouth, and lately I have used the method for malignant tumors within the sigmoid colon and for cancer of the cervix and other localities. It is the only method of treatment that offers any hope of cure in malignant dermatitis caused by the radium or röntgen rays. In this latter group of cases it is, of course, not preceded or followed by radiations.

CONCLUSIONS.

1. There is no question as to the advisability of surgical removal of malignant disease, providing the case is operable. One of the surest ways to cut the mortality in the immediate future from this disease is by not operating upon patients where metastases are just beginning to show, unless it is a known fact that such metastatic nodules can all be completely removed and that there are not deeper metastatic nodules that cannot be reached surgically. For reasons given in detail these patients should also be allowed whatever benefit preoperative and postoperative radiation can give.

2. The röntgen rays should be used in every case demanding radiation thereapy for all the lymphatics and the disease itself before radium is used, so as to wall off the diseased from the healthy tissue. Some borderline cases treated in this manner will become suitable for surgical interference.

3. Radium, because of its great destructive power locally, is the ideal agent for use within the growth itself, within metastatic nodules and recurrences. The best time to use radium is between the röntgen series of treatments. The first radium application should not be made until one series of röntgen radiations have been completed.

4. Recent marked advances in radiation therapy have shown us the correct percentages of radiations required to give a cancer knockout dose rather than a stimulating dose. At present the cancer dose is one hundred per cent. of an erythema dose. The future will probably bring out the fact that different types of cancer cells require slightly different intensities than these. To digress for a moment, we also know that a thirty per cent. dose will produce atrophy of the ovary and amenorrhea, seventy per cent. of an erythema dose will cause certain forms of sarcoma.

5. When it is possible to use electrothermic coagulation, we should not hesitate to use it. It is one of our best agents to successfully destroy malignancy.

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The Röntgen Ray Treatment of the Adenopathies*

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The advent of the x ray as a therapeutic measure has produced in none of the diseases of the human body more striking and beneficial results than in its effects on the adenopathies. It has practically revolutionized the therapeusis of these stubborn, resistant conditions and so revised medical and surgical judgment that today röntgen rays are properly regarded the most valuable means at the command of the profession in the treatment of enlarged lymphatic glands. This is a rather strong statement but a voluminous mass of literature and case reports accumulated particularly during the last eleven or twelve years bears ample testimony to its sincerity and truth.

Before progressing farther, it may be wise briefly to review the effect of x rays on lymphoid tissues. This may be summarized in the general statement that primarily the histological effect of radiation is a destructive action upon cells of an embryonic or rapidly proliferative type; a secondary obliterative endarteritis, with a consequent replacement of the lymphatic cell by fibroid tissue. Applying this knowledge to inflammation and hyperplasia of the lymphatics, it is obvious that this destructive metamorphosis and secondary fibrosis may be clinically made use of in all the dyscrasiæ of this system. However, as in many instances where theory and fact clash, experience has not invariably borne out the truth of the experimenter's dicta. But results are sufficiently encouraging to justify the universal opinion that present day medicine has in the röntgen ray the best palliative and in many instances curative agent in diseases of the lymphatic system. Unfortunately the rays are not a general panacea, and the mistake is too often made not to probe for the underlying or causative factor of the lymphatic enlargement. It seems entirely too primary to discuss this problem before a group of medical men, but it is a sad commentary upon our professional skill and judgment to note how frequently results are expected from this physical agent or even from any other form of local medication, when the actual cause of the enlarged gland is a dental infection, disease of the tonsils or the nasopharynx or some systemic infection. It is almost unnecessary, but the tautology may be excusable if we first urge careful search and exploration for the primary and underlying causative focus and direct first our therapeutic attention to its elimination. In such cases radiology occupies only a secondary position in treatment, and cases frequently intractable to radiation could be cured by a careful physical examination for the etiological factor producing the lymphatic enlargement. Lymphatic disease is usually a secondary phenomena and the indications for x ray treatment are applicable to only selected cases.

Knox's (1) classification of the conditions to which response to the x ray may be expected is probably the most satisfactory of any. He makes the following groups:

1. Inflammatory enlarged glands.
2. Lymphadenomatous glands.
3. Sarcomatous glands.
4. Tuberculous glands.
5. Carcinomatous glands.
6. Mixed infections.

In view of the recent researches of Witherbee and his associate workers of the Rockefeller Institute on the effect of the x ray on enlarged or diseased tonsils and adenoids, I have made a seventh heading for this variety of lymphoid tissue. Hodgkin's disease may likewise be included as a type of a lymphatic disease in which röntgenization is an indicated and advisable procedure. To take up these headings seriatim:

In the inflammatory type of enlarged gland there is rapid response to x ray treatment; a few exposures are usually sufficient to cause practically entire eradication of the disease. The majority of these cases are of cervical adenitis, most common in children and these are particularly amenable to radiation. Within the past few years surgery has been less and less resorted to, and the reason is obvious. Nasty angry looking scars, persistent and discharging sinuses, keloids and disfiguring cosmetic results were the sequence of the surgical knife; recurrence and repeated operation were common. X ray treatment has practically changed all this. No scarification results; surgery which only removed the palpably enlarged lymph nodes could not, except at the risk of a major and extensive operation with widespread dissection, remove all the diseased glands especially those deeply situated in the triangles of the neck. The experienced radiologist can apply the rays in such a way that deep penetration to the entire involved area is produced. In children especially it is not advisable to push the x ray to the limit of skin tolerance and treatments are kept considerably below what is considered an erythema dose. Although this paper will not endeavor to deal with the technicalities and method of procedure in x ray practice it is a *sine qua non* that proper dose, correct filtration, a thorough understanding of the technic of operating tube and apparatus and the essential of thoroughly protecting the surrounding uninvolved parts from the x rays is thoroughly understood and practised. Careless and indifferent röntgenology secures as poor results as any other improperly applied therapeutic agent.

It is not to be inferred that surgery does not have its place in the treatment of forms of adenitis. In the presence of abscess formation, where the mass is so large that toxic absorption is to be feared, or the finding of a softening or fluctuating focus, early incision is to be practised, the pus evacuated and this followed by speedy resumption of the röntgen ray treatment. Under these combined methods the sinuses heal in a few days and the resulting scar is practically invisible. Some of the English radiologists have a different method. Hernaman-Johnson (2) advises six to eight weeks preliminary x ray treatment before resorting to surgery, this producing subsidence of the periglandular swelling so that extirpation of the diseased gland is easily accomplished and with a minimum amount of scarring. He asserts that this preliminary x ray treatment in no way unfits that skin to withstand surgical trauma.

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*Read at a Symposium on Inflammations and Hyperplasias of the Lymph Nodes, at the meeting of the Northern Medical Association, November 25, 1921.

Some observers, notably Tousey, state that the good effect of radiation can be largely ascribed to its secondary alterative effects but this is doubtful, because not infrequently untoward symptoms of a depressing character are sequelæ of x ray exposure. Rather do I believe that the changes wrought by the rays are a cellular inhibition and disappearance and a secondary fibrosis of the lymphatic channels thus sealing off avenues for the spread of further infection.

It is difficult in many of these cases of adenitis to distinguish between the simple inflammatory or infective variety and the tuberculous type, unless, of course, there are present other stigmata of the tuberculous. Tuberculous adenitis has a somewhat slower response to the action of the x rays, but they usually do subside and become quiescent. However, recurrences are not infrequent, but usually react to repeated exposures. It is of course essential in individuals of low nutrition such as these lymphatic enlargements are found that thorough hygienic and dietetic discipline shall be a vitally important and materially factor to aid in securing rapid and permanent curative result. In this there should be thorough cooperation between the röntgenologist and the family physician. To effect an absolute cure in every case of adenitis would be a Utopian dream, but the results are sufficiently encouraging to justify the confidence which the profession has reposed in the radiation treatment. Strunsky (3) asserts that surgery only cures fifty-seven per cent. of these cases and that in twenty-five per cent. of those there is a local recurrence.

As opposed to this are the views of Judd (4), who said that he had "never seen a case of tuberculous adenitis that did not respond to x ray treatment"; Wilkinson, of Phoenix, Ariz., who does not recall a single case of enlarged cervical glands that has not yielded promptly to x ray. The profession has not entirely accepted Baetjer's (John Hopkins) belief (but it is extremely interesting in this connection), that the socalled thymic enlargements in infants and young children are merely enlarged or diseased substernal or mediastinal lymph nodes and their rapid disappearance and good clinical effects produced after x ray treatment is influenced by the same causes that produce disappearance of lymphatic swellings by this method elsewhere in the body. It is an empirically proved fact that the chronic cough in children, associated in a radiogram of the chest with enlarged substernal or peribronchial glands, frequently yield almost miraculously to one or two x ray treatments. In adults I have not found encouragement in röntgenizing these enlarged intrathoracic lymph nodes, although other operators report good results both clinically in the relief of pressure symptoms and proven radiographically in the diminution of the size of the glandular shadow.

In dealing with lymphadenoma, it may be well to discuss coincidentally Hodgkins's disease and lymphosarcomata, conditions very similar. The effect of x ray treatment and the progress of the disease under treatment is similar for them all and would seem to justify the contention of some observers that they are all one and the same disease and of common etiology. The response of the hyperplastic glands is extremely rapid under radiation. The growths seem to practically melt down under the rays and in this sense they seem to have a specific influence. Unfortunately these diseases are of a progressive nature. As the glands appear they are röntgenized, the glandular swelling disappears, but the patient himself is on a constant downhill path. The secondary anemia and progressive asthenia eventually cause the inevitable. No case of my experience has survived over four years beyond the onset of the disease, although three cases which were treated with x rays by myself died without any palpable evidence of glandular enlargement for several months before death.

A. F. Holding (5) draws the following conclusions from the report of thirty-five cases of lymphosarcoma treated in the Memorial Hospital during four years: "Surgical excision is contraindicated except in very early and strictly localized forms of the disease and since such anatomical conditions can seldom be demonstrated, surgical treatment is rarely admissible in this condition. The most effective treatment for lymphosarcoma at present is by radioactive measures rarely combined with surgery."

This much may be said, that although no treatment of Hodgkins's disease to date has proved satisfactory, the x ray affords more hope than any other method.

The x ray treatment of carcinomatous glands can hardly be rapidly dismissed, but details in a paper of this character would be out of place. The literature of this subject has been particularly prolific and its importance justifies more than the few generalizations which are herewith presented of the effect of the x ray on carcinomatous glands:

1. Carcinomatous glands respond slowly to the x rays.
2. They rarely entirely disappear.
3. Their disappearance at one region may be accompanied by rapid and progressive enlargement at a point considerably distant from the röntgenized area.
4. Occasionally a most rapid subsidence of the carcinomatous gland occurs and the disease is apparently arrested for a greater or less time.
5. In a few instances the x rays have apparently stimulated the glands to more rapid growth. This is unusual.
6. The newer technic of enormous dose, while still in the experimental stage, is sufficiently encouraging to justify a hope that we are approaching a new era where the word carcinoma does not synonymize with malignancy.

We are but on the threshold of our knowledge of the treatment of cancer with radiation, whether x ray or radium. Until something better offers it is aside from early surgical intervention in the incipiency of the disease, the only ray, faint though it may be, to light the sufferer on his fateful pathway, to what alas is almost the universal inevitable termination.

The interest that the x ray treatment of tonsils and adenoids has excited in the profession justifies a few words in a paper of this character. The early and experimental work was done in the Rockefeller Institute and while only a little over a year has passed since the publication of the results of these experiments, some glowing clinical reports have already been made. From its action on lymphoid tissue elsewhere, one would expect that the x rays would induce similar results when applied to the tonsils and the adenoids. A marked diminution in the size of the glands result with the emptying of the crypts and within six weeks the tonsils shrivel to a small fibrous cord. The atrophy of the tonsils and adenoids is a permanent one. Witherbee states that out of thirty-six cases treated within four weeks after one massive dose of x ray in thirty cases, hemolytic streptococci and staphylococci were entirely eliminated from the tonsils. These studies open a wide realm for further study and experimentation but for a time medical judgment is suspended until the utility and rationale of x raying these structures is definitely proven.

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Rhinoscleroma

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Although it is many years since dermatologists have evinced an interest in rhinoscleroma, it became my pleasant duty to review the subject in order to outline the points of differential diagnosis between this disease and granuloma inguinale, with which it had been supposed to have some relation. During this study the following notes were collected and a number of original photomicrographs were taken, which are thought worthy of publication.

Rhinoscleroma, also known as nasal scleroma, is a chronic infectious granuloma of the anterior nares, upper lip and adjacent tissue which is characterized by a sclerosis of the tissues leading to a blocking of the air passages, and subsequent deformity of different degrees. The question of etiology will be discussed later.

Hebra in 1870 was the first to describe the condition under the name of rhinosklerom. He had had a series of nine cases, four in men and five in women, which had first been considered as syphilitic, but antisyphilitic remedies had had no effect on the condition. Hebra was also able to recall a case seen in 1852 which was probaply of the same nature, and Weinlicher recalled seven cases seen in 1860 which were rhinoscleroma, although considered as carcinoma or syphilis at the time. Kaposi gave the histological description of rhinoscleroma in the same paper as Hebra. The number of cases of rhinoscleroma which have been reported has been variously estimated as from two hundred to eighty. Kaposi himself saw about fifty cases.

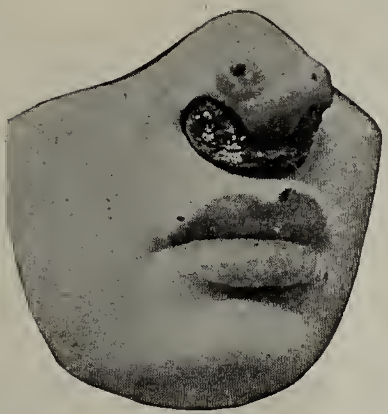
Fig. 1.—Rhinoscleroma after Jacobi.

There is apparently no geographical boundary or ethnical limits to the disease. Some authorities have considered that it was brought to Europe from Asia. Cases have been reported from all the European countries, Southeastern Russia, Egypt, India, Australia, Japan, Hawaii, South, Central and North America. For some time it was thought that native Americans did not have the disease, but such cases have been reported. One native American negro with scleroma of the larynx has also been reported.

Although the disease was supposed to have been more frequent among females than males, about an equal number of cases have been reported for each.

The disease affects the poorer classes, possibly because of the unhygienic surroundings. Trauma to the nose has also been considered a factor. More than one member of the family has been affected, and often several cases have been reported from one village or district.

It is difficult to state the age of onset, as the disease is insidious in the beginning. Few cases have been reported in young children, although there is nothing to prevent it in early life. Most of the patients have been young adults or the disease was known to have been present at that time. The incubation time has not been determined.

The disease may be primary or secondary on any of the parts mentioned below, but generally it begins on some portion of the anterior nasal mucous membrane. The upper lip and contiguous structures are also favorite sites, but scleroma may be present anywhere in the upper air passages, or the trachea and bronchi. The tongue is rarely affected. The eustachian tubes and the lobes of the ears have been reported as the site of the affection.

ONSET.

In the very beginning the diseased condition presents itself as soft, small, edematous, bluish red areas with well defined edges. Usually the areas are multiple and bilateral. Subcutaneous at first, the upper structures are soon affected, and the overlying epidermis presents a peculiar reddish or brownish tint, which is glistening or else scaly and crusted.

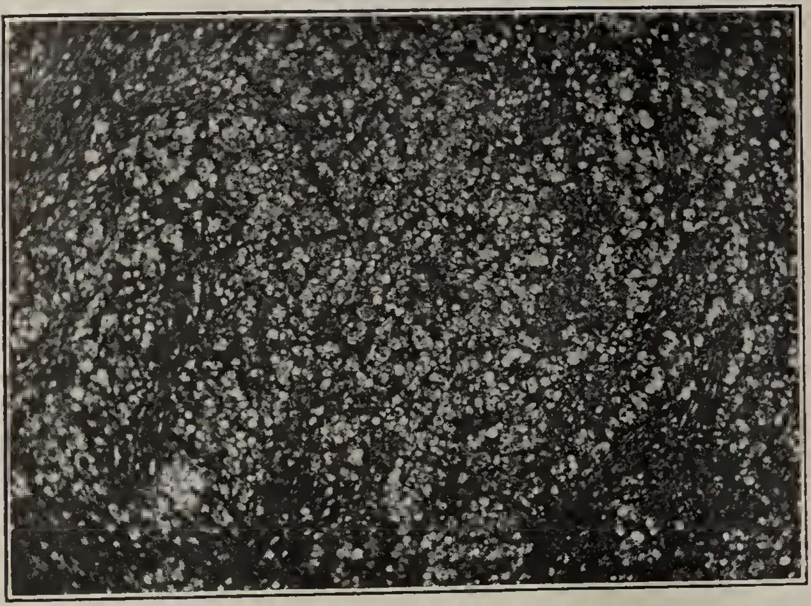

Fig. 2.—Low power photomicrograph.

The capillaries over the growth may be dilated and congested. Ultimately there are involutional changes accompanied by shrinkage, with diminution of the size of the masses which have become dense, hard, and firm. Deformity results which is dependent on the site of the disease. In the nares there is thickening and blockage of the passage. The tip of the nose becomes enlarged, and the skin ulcerates. Ulceration of the mucous membrane is rare.

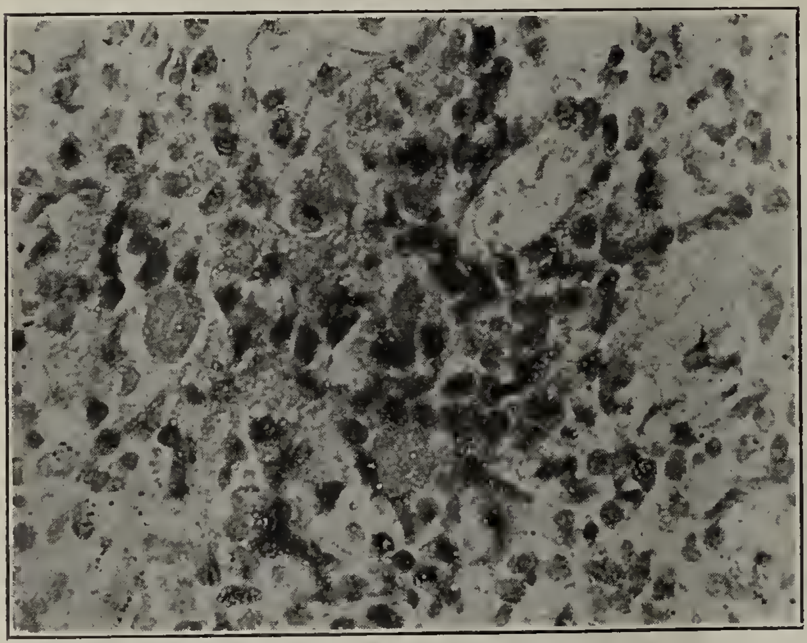

Fig. 3.—High power photomicrograph of rhinoscleroma tissue showing Mikulicz or foam cells and hyalinized cells of Unna.

COURSE OF THE DISEASE.

The course of the disease is extremely chronic. Cases running from fifteen to thirty years have been known. There is no glandular or lymph node involvement.

ETIOLOGY.

The etiology of rhinoscleroma has not been definitely determined. von Frisch in 1882 described an organism found in the condition. This organism is a short bacillus with rounded ends within a gelatine capsule, measuring two by five tenths microns, and may be found singly or in pairs or in groups.

The organism is easily stained, being gram negative, although if hardened in five per cent. formalin solution it is said to be gram positive. The organism is easily grown on agar agar, Loeffler's serum, or agar gelatine. No spores are formed. Morphologically the organism is said to be identical with the Friedlander pneumococcus or mucosus capsulatus. The organism isolated from rhinoscleroma is pathogenic for experimental animals, but no one has succeeded in reproducing the disease in animals as dogs, guineapigs, rabbits, or even apes.

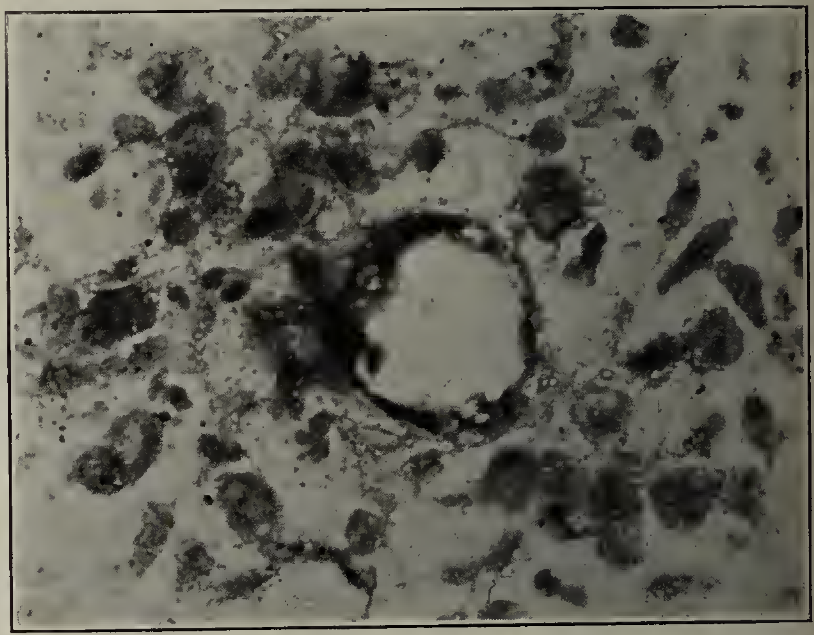

Fig. 4.—Rhinoscleroma bacillus (oil immersion, organisms within lace cell).

THEORIES.

Many have considered that the Frisch bacillus is identical with the ozena bacillus. It has also been asserted that the Frisch bacillus is only a secondary invader, and that it is found in the nasal cavities of twenty per cent. of normal persons. Brunner stated that he could distinguish the rhinoscleroma bacillus from others of the same group. Bailey

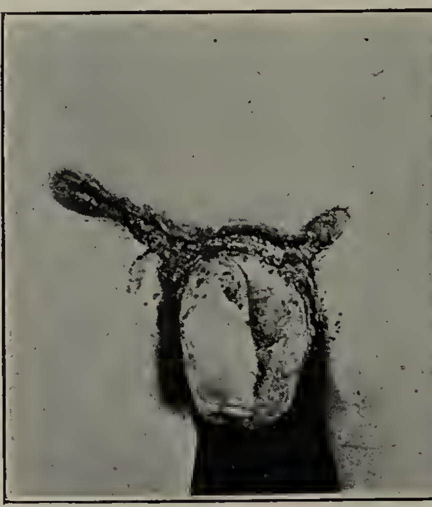

Fig. 5.—Granuloma inguinal.

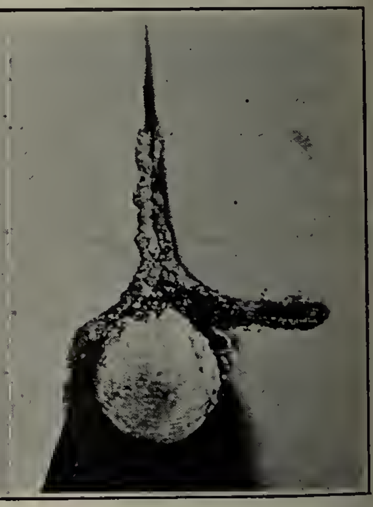

Fig. 6.—Granuloma inguinal.

found that the blood serum from a case of rhinoscleroma gave positive complement fixation tests for its own and one other strain of the rhinoscleroma bacilli.

Power to fix complement with other species of gram negative encapsulated bacilli from the respiratory tract, Friedlander bacillus, and including two strains of Bacillus lactis aerogenes was high but less high than with the rhinoscleroma bacillus. Bailey believed that because of its cultural characteristics and immunological reactions the rhinoscleroma bacillus would seem as much entitled to recognition as a species distinct from but closely related to other members of the group as are others now generally so recognized, and the results of the complement fixation tests favor the view that the rhinoscleroma bacillus is the etiological factor in this disease.

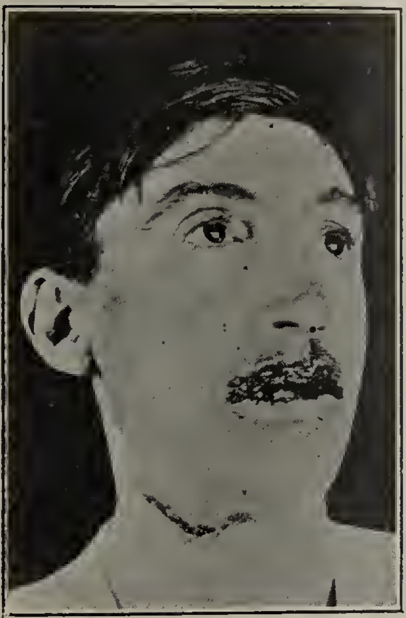

Fig. 7.—Granuloma inguinal. Lesions of lips and side of neck.

FIRST LESIONS.

The scleroma lesion apparently begins around the lymph and bloodvessels in the adventitial layer of the mucous membrane, and is thought to spread by these vessels. At first the vessels become dilated and then small round and plasma cells accumulate in large numbers around them. This causes the edema and the early appearance of the nodules. There is also a change in the elastic and connective tissue. Later the walls of the blood and lymph vessels become obliterated by the connective tissue and the cellular elements die. The softness is now lost except where the lesion is spreading, and the mucous membrane of the original focus becomes replaced by connective tissue. The epithelium may or may not be affected, but when it is implicated the ciliated cells are converted into thick layers of stratified squamous cells, and eventually the normal structure of the mucous membrane is destroyed. In the skin the sweat and sebaceous glands are atrophied without signs of inflammation.

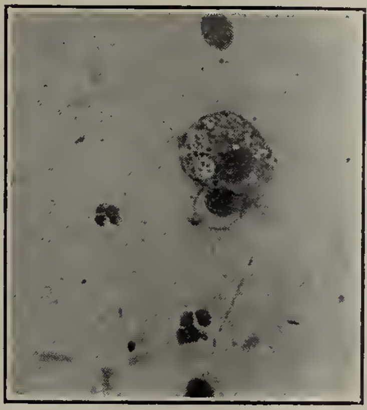

Fig. 8.—Organisms from a Porto Rican case inside large mononuclear cells.

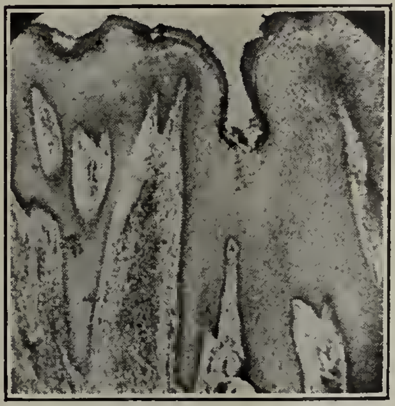

Fig. 9.—Granuloma inguinal. Elongated papillae and interpapillary processes.

PATHOLOGY.

According to Unna the granulomatous mass consists of large typical plasma cells, collections of which are irregularly scattered in all layers of the skin and subacutaneous tissue. The collagen fibres are increased and the collagen tissue thickened. The elastic layer is destroyed. As a regressive change is noted the presence of large (fifteen to twenty times the diameter of a red cell) oval, nucleated, dropsical cells of Mikulicz, also known as lace cells or foam cells. The foamy reticulated appearance of these cells is attributed to the mucous elaborated by the rhinoscleroma bacillus. Each of these cells contains from six to eight von Frisch organisms. There are also hyaline degenerated cells known as Russel bodies or cells of Pellezari. These are spherical in shape and are about four or five times the size of the surrounding plasma cells. No true giant cells are seen.

DIFFERENTIAL DIAGNOSIS.

The differential diagnosis from syphilis (gumma), carcinoma, sarcoma, keloid, leprosy, lupus, and gangosa is not difficult if one keeps in mind the three essential characteristics of rhinoscleroma, viz., the presence of the Frisch organism, the socalled foam bodies and the hyalinized cells.

CHRONICITY.

The disease is a progressive one. As mentioned, it is not uncommon to have cases exist for fifteen to thirty years. The disease is not a fatal one, except when the air passages are so much involved that suffocation ensues.

SURGERY.

Surgery was the earlier method of treatment, but recurrence was the rule. The use of radium and x ray has offered the best mode of treatment, and clinical cures have been claimed. Autogenous vaccines have not controlled the affection, but it has been said that cultures have been more scant after this mode of treatment. Antisyphilitic treatment has been of no avail.

RHINOSCLEROMA AND GRANULOMA INGUINALE.

Clinically and pathologically, rhinoscleroma and granuloma inguinale are very dissimilar, but the diseases have been thought to be somewhat related by reason of a supposed morphological resemblance of the organism encountered in each. This is the only link between the two diseases, but it is a weak one. Reference to the photographs and to my papers on the subject of granuloma inguinale as seen both in the tropics and in New York City will, I think, serve to fix the quality of these diseases (1).

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Report of a Case of Spontaneous Gangrene, Simulating Purpura, Due to Acute Thromboarteritis*

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When one considers the frequency of bacteremias in the early stages of certain wellknown acute infectious maladies, particularly typhoid fever and pneumonia, as well as the various septicemias, one cannot help being impressed with the rarity of involvement of the bloodvessels themselves. Albutt, indeed, mentions "that terrible disease as yet wrapped up in obscurity, in which arterial trunks are seized by an *acute arteritis* with agonizing pains and gangrene; this thromboangeitis is not to be confounded with the arteriosclerosis of hyperpiesis or of decrescense." It is possible that the occurrence of arterial infections is not so rare as we have been led to believe. Some cases, no doubt, are not recognized; others are mistaken for purpura or gangrene, the diagnosis being based upon clinical manifestations, rather than upon the underlying etiological and pathological conditions. Such diagnoses make it difficult to collect data and statistics which might aid us in throwing some light upon this obscure condition.

At the Philadelphia General Hospital we observed a case closely resembling purpura hemorrhagica, in which gangrene of the foot developed. The clinical diagnosis of acute thromboangeitis with gangrene was confirmed by the laboratory after microscopic studies were made of sections of the bloodvessels in the amputated leg.

I am indebted to Professor Solomon Solis Cohen for permission to report this case, which became of interest to his staff through his interest in it, coupled with the persistent refusal to accept the diagnosis of purpura hemorrhagica.

CASE.—E. H., white, male, eight years old, was admitted December 7, 1920, to Dr. Solis Cohen's service with a provisional diagnosis of purpura. The family history and past medical history have no bearing upon the case.

The present illness dated back one week. The mother stated that the trouble began on Wednesday night, December 1, 1920, when the boy complained of headache after supper. During the night he was restless and feverish, and vomited twice. There was no diarrhea, no convulsion. Headaches persisted on the following day. The patient was very pale. On Friday, purple blotches appeared on the knees and outer aspects of both legs; these blotches later showed themselves on the body as well. The limbs were said to "feel stiff and sting."

The physical examination revealed a glistening, red, injected pharyngeal mucous membrane; enlarged and injected tonsils; several small ulcerations on the tip of the tongue. On the chest were a few irregularly shaped pigmented patches with reddish borders. The lungs were negative. No murmur was heard in the heart, but the first sound was impure.

The extremities showed irregularly shaped and variously sized patches of discoloration over the lower extremities and a few in the upper limbs. These patches varied in intensity from a faint purplish hue to a true hemorrhagic condition with sloughing. The left leg was the worse, and showed confluence of some extensive areas. The left foot was blue, the toes cold, and bluish-black in color. No pulsation of the dorsalis pedis could be discerned. (See Fig. 1 and 2.)

The temperature on admission was 99° F.; later it went up to 104°. The pulse range was from 90 to 110. The Wassermann test was negative. The blood on admission showed 26,400 white blood cells; polymorphonuclears, eighty-one per cent.; lymphocytes, nineteen per cent.; coagulation time, two minutes and two and a half minutes; blood platelets, 328,800.

Bacteriological studies were made of the blood, of the pus from the ulcerated foot, and of cultures from the throat, the mouth, and teeth. The blood culture was sterile. The throat culture showed streptococci. The cultures from ulcers in the mouth showed Staphylococcus aureus, Streptococcus viridans and Micrococcus catarrhalis. The culture from the pus in the ulcerated foot contained Staphylococcus albus and a gram positive bacillus. The urine contained at times a trace of albumin.

The patient's condition became steadily worse. Gangrene developed in the left foot. (See Figs. 3 and 4.)

The surgeon (Dr. Loux) called in consultation, advised amputation above the knee; which operation he did on December 31st, about three and a half weeks after the patient's admission. Convalescence was slow and tedious but recovery finally ensued. When last heard from (January, 1922) the lad was robust and enjoying good health.

The amputated limb was sent to the pathological laboratory of the hospital, and studied by the histologist, Dr. W. P. Belk, who reported as follows:

Nine sections were taken from the amputated limb of E. H., Surgical Series No. 1807.

The large arteries showed a thickening of the media, which was due to a moderate proliferation of fairly young connective tissue cells. There was also a moderate amount of round cell infiltration in this arterial coat. At one point one large artery showed what appeared to be a very early and slightly marked necrosis. Opposite this there is a thrombus firmly attached to the intima. The endothelial coats at this point have been lost.

In all sections the small arteries showed a more advanced pathological process. The thickening—

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*Read before the Pathological Society, Philadelphia, February, 1922. From the service of Prof. Solomon Solis Cohen at the Philadelphia General Hospital.

still chiefly of the media—was great, resulting in the narrowing of the lumina to about one third or more of the original diameter. The fibrosis here was further developed and at points new bloodvessels could be seen within this new fibrous growth. Infiltration of lymphocytes in the arterial coats was quite noticeable. There was no marked perivascular, but a diffuse lymphocytic infiltration of a moderate degree throughout all tissues. Sections from necrotic areas showed the usual picture of necrosis, with infiltration of polymorphonuclear leucocytes.

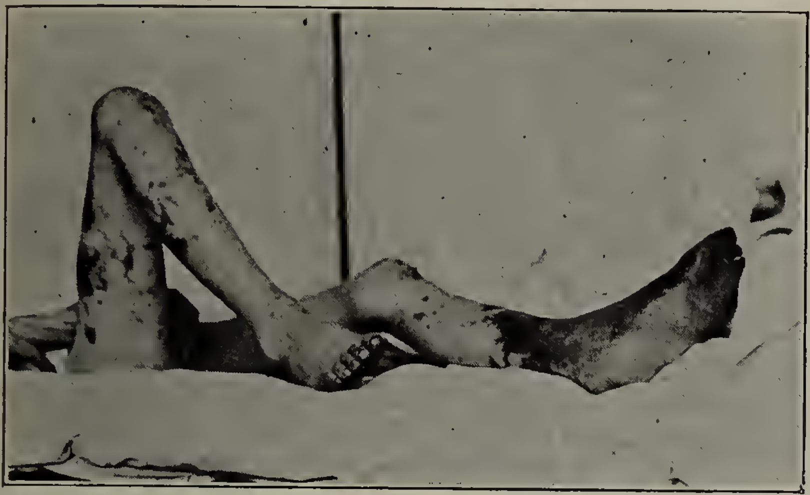

Fig. 1.—Lower extremities two weeks after onset, showing purpuric extravasations and beginning gangrene of the left foot involving the toes. Note the darker areas on right thigh, showing definite evidences of tissue changes.

The process was definitely an infectious one of moderate chronicity, probably of a duration of several weeks. Diagnosis: proliferative thromboarteritis.

DISCUSSION.

The diagnosis ordinarily made in cases of this type is purpura of either the hemorrhagic or the fulminating type. Schoenlein's purpura was suggested by one physician who saw our patient. There are scattered case reports in the literature, under superficial diagnoses of purpura or gangrene, which present a clinical picture that seems to demand more careful study before we can rule out some definite underlying condition, perhaps one common to all, and represented by that found in our case.

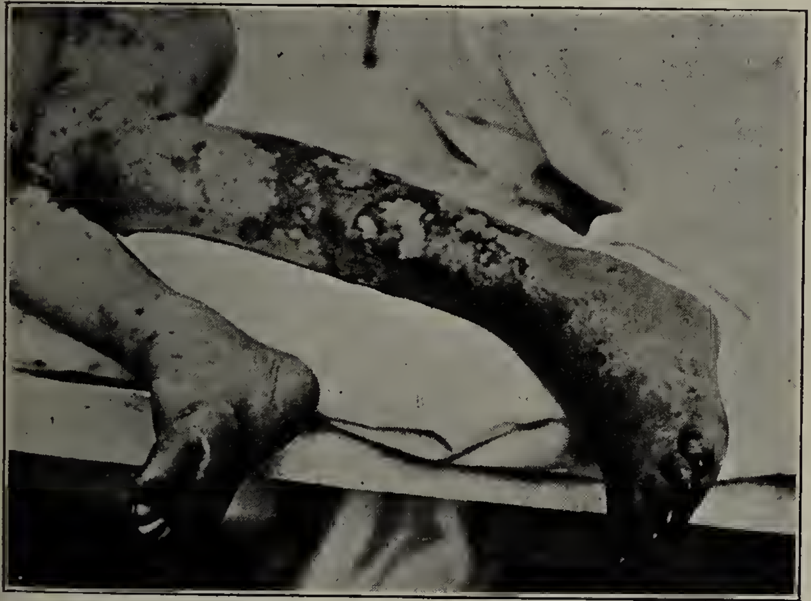

Fig. 2.—Same as Fig. 1.

Summarizing, we had a definite sudden onset: fever; an injected throat; and a high leucocytosis—26,400 with a relative polymorphonucleocytosis of eighty-one per cent. All these phenomena point to some septic condition. The fact that the blood culture was sterile does not necessarily mean that there was no bacteremia; certainly not that there was no involvement of bloodvessels; for the culture is negative, as a rule, in that recognized disease of the arteries, periarteritis nodosa.

Later the appearance of the socalled purpuric spots, of extensive areas of ecchymosis, and finally of gangrene, indicated that something had taken place in and about the bloodvessels. The fact that the blood platelets were normal, with a normal clotting time, seems to rule out, what we may call for distinction, the socalled true purpura, in which the hemorrhagic extravasations are said to be dependent upon some impairment of the blood clotting mechanism. Here we were evidently dealing with a more intensive condition. Areas of gangrene, which may involve an extremity, can only be attributed to some disturbance in the circulatory apparatus resulting in arterial occlusion. This occlusion may be spasmodic, as in Raynaud's syndrome, but in our case, was presumably owing to thrombus formation, originating directly from the inflamed arterial wall or from emboli which may have lodged in the vessel. If emboli, whence did they come? There was no endocarditis, there was no definite general infection—at least none that could be recognized. The throat condition seemed of importance as a possible focus of infection, but not otherwise. Attention was therefore turned to an inflammatory process involving the vessels themselves. Such inflamma-

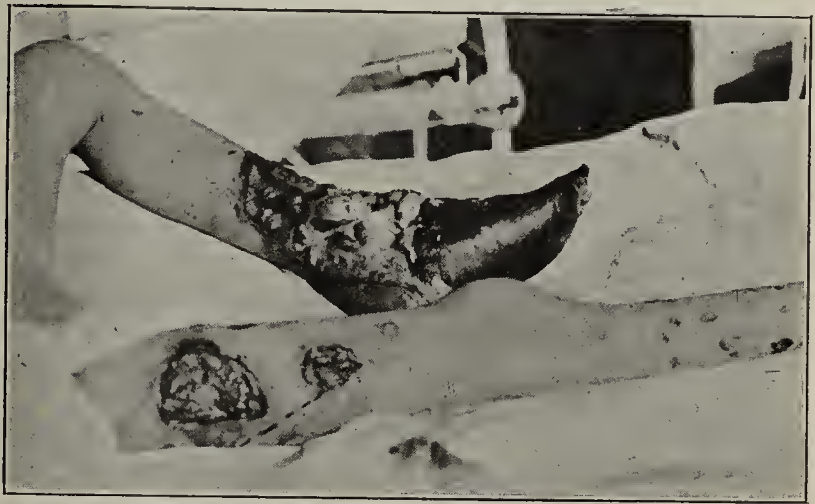

Fig. 3.—Four weeks after onset. Sloughing and gangrene involving left foot. Sloughing ulcerated areas on right thigh.

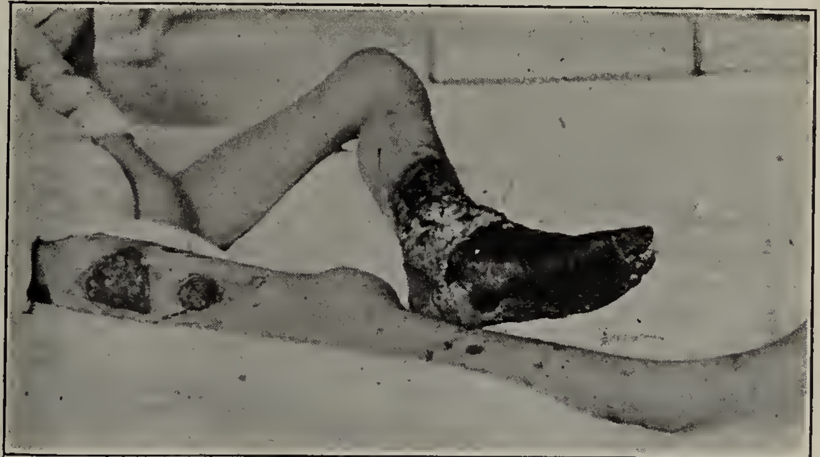

Fig. 4.—Same as Fig. 3.

tions, producing destruction in some cases, and occlusion in others, are known to occur. With these facts in mind diagnosis was definitely entered as acute thromboarteritis.

Arteritis has been observed in connection with such infections as diphtheria, influenza, pneumonia, typhus and typhoid fevers, scarlet fever, measles, rheumatic fever, and syphilis. It may also occur independently.

ETIOLOGY.

The exact nature of the causative agent, whether toxin or bacterium, is still an open question. In the group of cases which seem to develop independently the condition may be due to some strain of the streptococcus group. This view is favored by the frequency of sore throat and the persistent finding of some form of Streptococcus. Klotz, Bailly, Head, and Manges and Baehr report the presence of this germ somewhere in the patients whom they have studied. In our case streptococci were found in the throat and in the ulcers of the mouth. Unfortunately, the blood cultures revealed nothing to help us in arriving at a definite conclusion.

The question of syphilis is always raised when dealing with diseases of the arteries. The spirochete is notorious for its influence upon the aorta and the circulatory system but it is not found necessarily in acute arteritis. However, it may be a predisposing factor by weakening the walls of the vessels, making them less resistant to bacterial invasion. It could hardly account for the clinical picture of an acute infection with septic temperature and leucocytosis.

PATHOGENESIS.

The manner in which the bacterial agent enters the vessel walls is debatable. The avenue of infection varies. The intima may be infected, a, directly, either by the microorganism or by an embolus which becomes lodged in the lumen of the vessel; or, b, indirectly, by an extension of the process from the outer coats. The media and adventitia may be the starting points, the infective agent gaining entrance by way of the vasa vasorum or perivascular lymphatics. Klotz emphasizes the importance of the perivascular lymphatics and their relation to the entrance of bacteria into and about the arterial walls.

CLINICAL COURSE.

I shall confine myself to the acute forms of arteritis which usually come on suddenly with headaches and severe pains over the region of the affected vessels. Abdominal cramps and vomiting may be present. Often there is a history of sore throat. Fever is the rule, and is ordinarily of the septic type. Commonly there is marked leucocytosis.

PATHOLOGY.

Macroscopically, there are areas of ecchymosis, necrosis and gangrene. The gangrene may appear in local areas or it may involve either an entire limb or two or more extremities. In the periarteritis nodosa type there may be found small, hard nodules and aneurysmal dilatations along the course of the involved arteries.

Microscopically various lesions in and about the vessel walls have been described. The pathological picture differs with the type and virulence of the infection, with its chronicity and with the proximity of the area examined to the site of greatest activity—possibly the focus of infection. Any vessel may be involved but the medium sized and smaller arteries show the greatest changes.

The intima may be swollen, with proliferation. In some areas one may find thrombi resting upon the intima; in others the intima is lost. In some vessels there is complete obliteration of the lumen by a thrombus which may or may not show organization and canalization, depending upon the time of its formation. The media is nearly always affected and evidently early in the disease. In this coat one may find infiltrations of all types of cells, with thickening that may encroach upon the lumen of the artery. Later on there is found hyaline degeneration and fibrosis. The adventitia usually shows more or less cellular infiltration, especially in cases of periarteritis nodosa. In nearly all cases there is more or less cellular infiltration in the perivascular tissues.

DIAGNOSIS.

Acute thromboarteritis may be recognized by its clinical picture—sudden onset; septic temperature; severe pains; leucocytosis; hemorrhagic extravasations under the skin; areas of sloughing and gangrene; clotting time is normal or accelerated; platelets are not deficient. It is confirmed by a microscopic study of the arterial walls which should reveal the lesions already described.

DIFFERENTIAL DIAGNOSIS.

Purpura fulminans and other types of purpura must be ruled out. True purpura is a condition in which there are extravasations of blood into the surrounding tissues as a result of some disturbance or defect of the blood clotting mechanism. In acute arteritis there is a definite picture of an infection, with leucocytosis; the blood platelets and clotting time are normal. Syphilis can be ruled out because of the fact that in these cases there is a septic condition, as well as by the absence of a history of lues and by serological study.

CONCLUSIONS.

1. There is an infection of the arteries independent of the general maladies which may be associated with bacteremias.
2. It is an acute condition with a definite clinical picture.
3. According to reported findings in the literature it is presumably caused by some strain of streptococcus, and the point of entrance may be the throat.
4. The lesions in the vessels are varied. The media is most commonly involved. The intima and adventitia, as well as the perivascular tissues, likewise show evidences of inflammation.
5. Diagnoses such as purpura and gangrene should be questioned until all definite conditions can be excluded.
6. There may be hematuria and albuminuria.
7. The clinical picture in the early stage is vague and indefinite so far as a diagnosis is concerned, although it is quite evident that the patient is seriously ill. Later as the bloodvessels become more definitely involved, through the direct action of the bacteria or their toxins upon the arteries, thrombi are produced with occlusion of the lumen of the

vessels or rupture of their walls, and the clinical aspect becomes clearer. These developments may be manifested by intense pain, socalled purpuric extravasations of blood, and gangrene. Diagnoses of purpura and gangrene are then likely to be made—vague terms which should be discouraged, since they fail to give any indication of the underlying pathological condition or its etiology.

8. Usually the extremities, both upper and lower, are affected. The larger vessels may be involved as well as the medium sized and smaller ones, although the latter commonly show the more marked changes.

9. The condition may terminate fatally within a few days or the patient may gradually recover with sloughing of the gangrenous areas, or after surgical intervention.

10. The future of the patients who recover is problematical. It seems hardly possible that an infection of such delicate structures can subside without leaving some permanent damage. It will be interesting to follow up such cases and to see whether at some future time there may not develop circulatory disturbances with symptoms and trophic changes not unlike those seen in Buerger's disease, or perhaps endocardial or other inflammations of embolic origin.

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What the Family Physician Should Know About Cancer

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Cancer is on the increase; of this there seems to be no doubt. No matter how carefully we consider the possibility that greater skill in diagnosis has caused more cases to be reported, that better regulation of vital records has resulted in cancer being given as a cause of death, when hitherto a contributing cause had been permitted to be recorded as the prime one; considering all these possibilities, the statistics from every part of the world are too unanimous to be explained away by any reasons such as these. And this increase in the number of deaths from cancer is all the more serious and discouraging when we take into account the fact that during the past score of years, while the death rate has been steadily climbing, the combined efforts of pathologists, surgeons, and clinicians have piled up more weapons to be wielded against it, have gathered more actual knowledge concerning it, than was ever marshalled before during all the history of medicine.

We do not yet know the cause of cancer; and we are still in ignorance of many of the most important factors accounting for its frightful prevalence and high mortality, but these reasons are not sufficient to keep us from making better headway against its ravages than has in the past been the case. The knowledge which we now possess, granting that it is incomplete and far from satisfactory, is yet quite sufficient to make us cut the prevailing mortality statistics in half, if not to reduce them even further.

But how can this be done? Shall we follow the lead of those who class cancer as a deficiency disease, and are doubtful or wholly unconvinced of the ultimate benefits of surgery, radium or x ray? Or, shall we accept the view that is constantly gaining ground, that is, regard it as the development of certain of the individual's epithelial cells which by receiving some stimulus have so altered their original and normal characteristics as to impel them to a "riotous growth," and thus bring about the condition we designate as carcinoma? Both views have been defended by an abundance of able arguments and reinforced by impressive evidence, but we have not yet arrived at any definite conclusion. Meanwhile, more people die of cancer every day, and the ever increasing multitude upon whom the terrible shadow is even now falling are holding out their hands to us for help.

In the last analysis it is from the general practitioner that this help must come. Upon him lies the double responsibility of early diagnosis in those cases which are brought to his attention, and of educating the public to comprehend the necessity of early treatment and the recognition of the first warnings of the impending disease. No society—however well organized and efficient—can ever reach the ears of the multitude as surely as the voice of the family doctor, no great specialist can even hope to see for the first time in his clinic or private office material that continually comes to the general practitioner as he plods along upon his daily round.

Therefore, the two things which are of first importance for the general practitioner to know, are: What to tell that fraction of the general public which makes up his practice about cancer, and how to make a diagnosis of cancer early enough to permit a good chance of cure. For whatever the variance among scientists and clinicians about cause, or course, or treatment, there is one point of unanimous agreement, the absolute necessity of early recognition and prompt treatment if the death rate is to be reduced. The only way to check the ravages of the cancer scourge is to disseminate knowledge of the disease among all classes of people. This knowledge must be carried to all parts of the country, and with it must go a message of hope and courage and good cheer, none the less scientific because it is told in language simple enough to be understood even by the unlettered. The general practitioner may know more about cancer than is now the ordinary rule. The doctor as well as the patient must realize how vitally important are early recognition and prompt and adequate treatment. If the family physician would take pains to keep abreast of every advance made in this most important field he would be able to offer a much more cheerful prognosis than he often does. The treatment of cancer by radium has made remarkable strides during the past few years. Hardly a number of a medical journal comes out without reporting new evidence of the increasing usefulness of radium, becoming each day more apparent as the technic of its application is improved. "To be effective this work must be thoroughly done through a campaign which shall reach every corner of the land with its message of hope stated in simple language, yet proceeding from an impeachable scientific basis. The busy general practitioner knows too little about cancer." When it becomes more generally known among the laity that a diagnosis of cancer does not necessarily mean either certain death or a mutilating operation, these patients will present themselves for examination much earlier and more willingly. Not the least of the advantages of radium therapy lies in the fact that the diagnosing physician can now so often brush aside all the patient's terror of the knife and fear of a prolonged hospital stay, neither of which is necessary if the case is amenable to radiation.

The general practitioner should be at all times keenly alive to the possibilities which apparently insignificant symptoms may hold out. This does not mean that we must all become alarmists, but it does mean that a frightened patient is far better than a dead or dying one, and when there is any doubt the physician has no right to "take a chance."

Cancer is, as we all know, a purely local disease at the outset, beginning its growth in a very small area, from which it spreads until the adjacent tissues are infiltrated, and the blood and lymphatic channels eventually invaded, thus making possible metastases in other parts of the organism. The idea that any form of carcinoma is a socalled blood disease dies very hard, even among the medical profession. This long ago exploded theory rests on the fact that the invasion of the circulating system in the later stages of the disease does make possible the general dissemination of the cancerous cells, and among the laity, the notion is industriously fostered by the venders of patent socalled blood purifiers and other internal cures.

The medical man should never forget that a cancerous lesion may remain latent and apparently benign for a long period, and seemingly harmless growths, ulcers and areas of chronic inflammation, warts or scars or "moth patches," may quite suddenly take on a wholly unlooked for malignancy. Observation has demonstrated that a continuous irritation, burning, scratching, rubbing, or any other form of continued trauma, may offer a good point of departure for a malignant growth. A bruise on the breast should always be carefully watched, especially in a woman over thirty-five. If a patient's history gives suspicion of previous stomach ulcer, or the practitioner has personal knowledge of such a lesion, he should keep the possibility of a resulting gastric carcinoma always in mind.

Occupation may have an important bearing on the interpretation of apparently insignificant symptoms. The most familiar example of this is the tendency to cancer of the bladder displayed by workers in aniline dyes.

Any lesions about the mouth and throat should have most careful scrutiny and consideration. The lesions of syphilis and cancer are not readily differentiated, and a chronic syphilitic lesion may readily develop into cancer. A positive Wassermann reaction, therefore, does not in any way shut out the possibility of a malignant growth, a fact which should be kept constantly in mind. Most authorities agree that the irritation of the mucous surfaces of the lips and buccal cavity by tobacco, both smoked and chewed, is prone to give rise to cancer. The combination of neglected teeth with the possible syphilis, which we all see so often, is ideal for the propagation of any form of malignancy. Howard Kelly states that he has seen cancer of the penis caused by the irritation of gonorrheal secretions.

Erosions and lacerations of the cervix of the uterus—common sequelæ of even normal labor—are probably the factors usually predisposing to cancer of that region. Deep lacerations are often overlooked when the more obvious ones are repaired by the obstetrician after delivery, for many of them can only be detected when involution has taken place. There is much to be said in favor of the plan which has been ardently advocated in some quarters, that all women should undergo a routine examination three months after the occurrence of labor, with a view to doing away with all precancerous lesions, and it would certainly seem advisable for all women who have borne children to have vaginal examinations made as they approach the menopause. The hyperplastic endometritis in conjunction with uterine fibromyoma is now believed to be a very important causative agent in the production of cancer of the fundus.

Any irregular bleeding should be carefully investigated, and occurring near the menopause age makes it doubly suspicious. The general practitioner should not lose a single opportunity to impress this upon his women patients who consult him during this period; a more frank attitude on his part, and a more general knowledge of these facts among women, would greatly lower the cancer mortality.

The socalled indigestion of the patient who "will never see forty again" should not be disregarded no matter how oft repeated and familiar the story. Cancer of the digestive organs is of too frequent occurrence to permit digestive irregularities or obstinate constipation to be dismissed with a perfunctory prescription. If there is also loss of weight the combination is suggestive enough to warrant a thorough examination. Should nothing be found, so much the better. Occult blood in the stool should put every medical man on his guard at once, and complaint of "bleeding piles" should never be lightly regarded.

Do not forget that "many tumors which are essentially benign in character have been shown to be capable of malignant transformation, especially in the later years of life. These include papillomas, adenomas of the thyroid and of the intestines, villous tumors of the bladder, papillary and cystic tumors of the ovary and of the breast, polyps of the uterus or the rectum, and, in fact, all the tumors in which the epithelial elements are in preponderance. There can be no question that the cure or the removal of all such lesions is a vital indication."

We should always consider the possibility that any involution changes, even though they are physiological in nature, may predispose to cancer, especially in organs such as the prostate and the female breast. The cancer incidence in chronic cystic mastitis arising from involution phenomena in the breast, has been estimated to be as high as twenty-five per cent., and it is universally conceded that hypertrophy and chronic prostatitis go before carcinoma in a vast majority of cases.

Since the formation of the American Society for the Control of Cancer, and the excellent work they have carried on, the question of the microscopical diagnosis of suspected cancer tissue has been much agitated. This first took the form of a discussion as to whether such examinations should be made gratuitously by state pathological laboratories, as is now done for contagious and infectious diseases, but this was soon swallowed up in the more momentous consideration of the advisability of removing suspected tissues for microscopic study. The position of the society was set forth as follows:

"In the removal of tumor tissue for diagnosis, the advantage of such microscopic examination, as well as the danger of aggravating the disease by this procedure, must be considered. In many cases the advantage of diagnosis outweighs the danger of removal of tissue for this purpose, and the procedure is justified in the opinion of the majority. The necessity for this may be determined by the skill of the clinician. Opposed to the procedure in general is the danger of aggravating the condition by the excision, and this varies according to the nature and the position of the growth. To cut through the skin into a malignant tumor of the breast is generally discountenanced. Errors in diagnosis result from the excision of inflammatory tissue on the margin of a tumor when the section does not include tumor tissue, this being most frequent in the breast and prostate. Incisions into actively growing, deep seated malignant tumors should be avoided, as this may disseminate infection through the vessels, may permit extension, or accelerate growth by relief of capsular tension. There is little danger, however, from the proper removal of tissue from any superficial growth of the skin or mucous membrane. Crushing or kneading malignant tissue should be carefully avoided under all circumstances."

Three years ago Robert B. Greenough, of Boston, obtained from one hundred and thirty-four surgeons, gynecologists, and others especially interested in the subject of cancer, opinions in regard to the value of this means of diagnosis, which he summed up as follows:

"Many surgeons believe it is never necessary or advisable; others, and they are in the majority, believe that in certain situations it is permissible when all other sources of diagnosis (in which should be counted the benefits of consultation) have been exhausted and even then only, 1, when the tumor is a superficial one, or, 2, when a frozen section can be obtained immediately and the operation completed under one anesthesia. Under these conditions and under these conditions only, can the exploratory incision of the tumor tissue be justified as a reasonable surgical procedure."

It is Bloodgood's opinion, based on the data supplied by his questionnaire, that, "in general, superficial and ulcerated lesions are the only ones from which fragments of tissue may be safely removed for microscopic diagnosis. In deep tumors, where the exploratory incision necessarily opens up normal tissue to infection, exploratory excision of suspected tissue is to be condemned and should be avoided. Where other sources of diagnosis have been exhausted, an exploratory excision, with immediate performance of the radical operation if it prove necessary, is the least dangerous procedure for the patient. No suspected tissue should be excised for diagnosis unless by a surgeon who is equipped to perform immediately the radical operation for the cure of cancer of the organ involved."

The practitioner should avoid placing reliance upon any single method of diagnosis. This is especially true in regard to the interpretation of x ray plates. They are extremely valuable in conjunction with clinical findings, but a negative x ray finding should never be regarded as proof that no malignancy exists, unless this conclusion is confirmed by all the clinical evidence.

BASAL CELLED EPITHELIOMA OF THE SKIN OF THE FACE.

This is perhaps the form of cancer most frequently brought to the attention of the family doctor. It begins as a horny scurfy patch on the face, less often on the hand, or it may take the form of an inflamed area of sebaceous glands, pale in color, usually itching sufficiently to lead to scratching which will soon cause it to break down at the centre and form a crust. This crust often falls off, but the raw surface beneath it never heals and the lesion gradually increases in size, constantly invading more tissue, often destroying a large portion of the face before death comes to relieve its victim. The general practitioner is rarely able to diagnose satisfactorily special skin conditions. His wisest course is to refer all suspicious skin lesions to a competent dermatologist, at the earliest possible moment. In no form of carcinoma is early recognition of so much importance as that involving the skin of the face. Radium is rapidly taking its place as the treatment of choice in attempting the cure of these conditions. It is still too early to dogmatize, but the extended success of very conservative operators every day adds weight to the enthusiasm and possible overoptimism evidenced by dermatologists everywhere. Elsewhere I have reported my own results after employing radium in these skin lesions. The cosmetic effects were almost unbelievably good and the psychic effect on the patient played no small part in the ultimate outcome of the treatment. Instead of going from the physician's hands, cured perhaps, but forced to carry to his grave repulsive and disfiguring scars, such as the most skilful surgeon cannot fail to leave, radium treatment has repeatedly obtained equally favorable results and left no mark whatsoever, or at least the scarring was so insignificant as not to alter the patient's appearance to any appreciable extent.

CARCINOMA OF THE LIP.

This form of carcinoma is commonly an indurated chronic ulcer or nonulcerated thickening on the free border of the lip; it is unusual for it to occur as a wartlike growth. It is often mistaken for a syphilitic lesion, and a positive Wassermann reaction regarded as shutting out the possibility of cancer. It must be borne in mind, however, that the two conditions can exist at one time in any given individual, and that delay is just as fatal if the patient has a coexisting syphilis. If surgery is employed in doubtful cases the suspected tissue should be excised with a good margin and if the microscope shows carcinoma, the lymph nodes of the submental and submaxillary region on the side affected, should be immediately dissected. Should the lesion be in the middle this same procedure must be carried out on both sides, the whole of the submaxillary salivary gland being excised in either case. This regional neck dissection is of great importance, as its neglect is one of the chief causes of operative failure.

Carcinoma of the lip offers one of the best opportunities for radium therapy, and has yielded a higher percentage of cures than any other known method. Glandular involvement should be surgically treated. I have remarked elsewhere that when such cancers "are yet small and superficial, the prognosis for successful radium treatment is usually very good. When the growth is limited to the lip and no glandular involvement has yet occurred, radium is certainly preferable to any other curative means. Where the glands are enlarged the use of radium should be confined to the lip and the glands extirpated by surgery, the entire neck being first rayed. There is no doubt that as soon as there is a general recognition of the fact that this grave condition can be cured without a painful operation with its resulting disfigurement, many more patients will apply for early treatment, which will result in the saving of many lives."

Among the most common and also most malignant of the easily reached forms of carcinoma are those affecting the jaw, the mouth, and the tongue, as they are of the squamous celled type, with early metastases to the submental, submaxillary and carotid nodes, with rapidly spreading invasion of the neighboring tissues. Crile regards cancer of the larynx as giving a relatively hopeful prognosis and has operated successfully in a large number of cases. Other surgeons are not so optimistic. Radium treatment offers about the same prognosis as surgery. In all these forms of carcinoma the outlook, even if treatment is undertaken early, is very grave.

CARCINOMA OF THE STOMACH.

This is the most common form of cancer occurring in males, and makes up about forty per cent. of all cases. The differential diagnosis can only be determined by the employment of x ray and careful laboratory investigation of the gastric contents, and the vague uncertain symptoms make it one of the most insidious conditions with which the family physician has to deal. The usual history is a gradually increasing "dyspepsia," loss of weight, and if the condition is advanced, or follows chronic gastric ulcer, hyperacidity, pain, and blood in the vomitus or stool may also be present. Unfortunately these symptoms can also be presented by a host of other conditions in no way related to cancer, and when the condition has advanced far enough to permit a tumor to be palpated, it is ordinarily beyond cure.

In making a diagnosis of carcinoma of the stomach syphilis must always be borne in mind. I had a case where the diagnosis of gastric carcinoma had been firmly established, which later proved to be a syphilitic gastric ulcer. I have also seen one where carcinoma of the stomach was present but there was also an unrecognized concurrent gastric syphilis.

The general practitioner's only course is to regard with suspicion all stomach complaints in middleaged patients, especially men over forty who tend to be gluttonous or overindulgent in alcohol and tobacco, and if the difficulty does not respond immediately to treatment, to have an x ray examination made, together with a careful analysis of the gastric contents. A marked reduction or absence of free hydrochloric acid, although it may occur in other disorders, should make one suspicious of cancer. A patient, especially of middle age or past, should have the benefit of a röntgenological examination if he has had for several months a stomach complaint not amenable to dietary or general hygienic measures, especially of pain, vomiting and loss of weight and strength are associated, even if the symptoms are not marked and the patient is believed to be neurotic.

"While röntgenological examination should be made, if possible, by an experienced specialist, this is not always practicable; but the novice, if he is conservative, uses commonsense, and limits his positive diagnosis to those cases in which he finds a permanent filling defect and which are at least suspicious clinically, may attain a fair degree of success."

The radium treatment of stomach carcinoma has not yet been undertaken extensively enough to warrant generalization. Janeway has "obtained notable reduction in the size of tumors of the stomach" with "subjective improvement" when the element was applied both externally and internally. He thinks that "we have in radium an important palliative agent in the treatment of cancer of the stomach."

CARCINOMA OF THE COLON.

This form of cancer is common in elderly persons, as is also carcinoma of the rectum, the latter form being occasionally found in younger patients as well. The symptoms of the two forms are similar, bloody stools, vague intestinal indigestion, loss of weight, and later increasing obstruction of the lumen. Rectal cancer is often treated as hemorrhoids until all chance of radical cure by operation is past. Early operation is usually successful, but so few of these cases are recognized in time that the percentage of cures is very small. Radium has given fair results. Its use is advisable in inoperable cases also. Digital and protoscopic examinations should always be made, and if the trouble is situated in the colon the x ray should be used or even an exploratory laparatomy performed.

Handford, of Chicago, reports that in two cases of rectal cancer near the sphincter, no trace of the mass could be found two months after he had made three radium exposures of eight to ten hours each. He used radium most successfully in cases where the growth was situated in the middle portion of the rectum. I have also had good results from the use of radium in cancer of the rectum, although the treatment was given too recently to be able to judge finally what the outcome will be.

PANCREAS, GALLBLADDER, AND LIVER.

These carcinomata are fortunately rare, as they are in most cases incurable. A history of gallstone disease is suspicious. Cancer of the liver is usually secondary to some other primary focus: it cannot be relieved by operation.

CARCINOMA OF THE BLADDER.

This occurs in both males and females. Its only early symptom is the painless passage of blood in the urine, and such a history should always put the physician upon his guard, even when the patient accounts for it by a supposed strain or trauma. Transperitoneal operation with removal of the affected portion of the bladder is the standard operation for radical cure, and a number of successful cases are on record. The prognosis is, however, extremely grave.

Radium should be tried in all cases of bladder carcinoma except possibly those coming to operation very early. Geraghty, of Baltimore, advocates its use, and says it "has certainly proved to be a valuable aid in the treatment of bladder tumors." He noticed that while the use of radium did not seem to diminish the tendency of bladder tumors to recur, the recurrence in most cases responded well to radium treatment.

UTERINE CARCINOMA.

Uterine carcinoma situated in the cervix, and less frequently in the fundus, is the form of cancer most common to women. Emil Ries states that carcinoma of the uterus is frequently overlooked because "the textbooks still talk about pain and odor in these cases but anyone who waits for these symptoms before making a diagnosis, is waiting for the death of the patient. The early symptom is irregular hemorrhage, and this should arouse the suspicion of the physician in every case. It is wrong to wait for discharge, pain and cachexia to make the diagnosis of carcinoma." If a discharge has been present for some time, any change in its character should make the physician watchful; that is, if the discharge reappears after a period of freedom from it, or if it become more profuse, more irritating, or has a more offensive odor, even if occult blood is absent.

Until recently complete hysterectomy was regarded as the only possible cure for uterine cancer, but the results were often highly unsatisfactory, the sequelæ as bad, or even worse, than the original condition, and the mortality very high. At present some of the most conservative gynecologists are employing radium in this condition and successes are being reported in ever increasing numbers. At first it was only in inoperable cases, and under the circumstances the results did not appear to be very good, but some operators were so delighted with its efficacy, even under the unfavorable and discouraging conditions to which its use had been limited, that they extended radium application to cases coming under observation early enough to offer some hope of complete cure, and here again radium more than fulfilled the hopes of its most enthusiastic devotees.

Recasens, of Madrid, who at first used it only in cases too far advanced for operation, or where surgery was contraindicated for some other reason, now believes that if in inoperable cancer in which an actual extension to the parametrium exists, so there is no hope of cure by operation, sixty per cent. of the cases can be cleared up with radium, it is only commonsense to reason that a condition such as early circumscribed cancer of the cervix can be cured by its use.

Janeway regards radium without the addition of surgery to be the best method for cervical carcinoma. Compared with the standard Wertheim operation with which even the best operators lose a quarter of their patients, and succeed in curing less than a third of those who survive the original intervention, he thinks that radium with no initial mortality and a far higher percentage of cure should certainly take precedence.

CARCINOMA OF THE BREAST.

This occurs most frequently in nulliparous women, and the earliest symptom is likely to be a painless tumor. Sometimes the skin will show a definite adherence to the lump, or a mere loss of motility, or perhaps the nipple will be indented. Rarely, the first manifestation will be enlargement of the axillary nodes. "The most significant facts in the diagnosis are the absence of pain and the early adherence of the skin to the tumor. A lump in the breast of any woman, particularly if she is over thirty-five years of age, must be suspected to be cancer until pathological proof of some other disease is obtained."

There is much variance of opinion about the best treatment of mammary cancer. The general practitioner is, however, less concerned with this, as his chief responsibility consists in making an early diagnosis and convincing his patient of the need of immediate extirpation. The author has elsewhere advocated surgery in cancer of the breast, making use of radium if the condition is inoperable or there is recurrence after operation. Radium is useful as a prophylactic treatment following mammary operations, particularly upon the axillary glands.

CARCINOMA OF THE PROSTATE, THE PENIS, AND THE VULVA.

These carcinomata occur occasionally. The condition is not often observed in the prostate, except on microscopic examination of the excised tissue. When the penis is involved there is a papillary or indurated ulcerated tumor, with early extension to the lymph nodes of the groin. Carcinoma of the vulva usually follows leukoplakia of the region, and occurs in women past the menopausal age. If carcinoma of the prostate is recognized before it is past all hope of amelioration, radium needles will sometimes prove of great benefit. Radium may also be employed on the penis or the vulva in certain cases. Surgery sometimes proves efficacious. The choice lies between the two curative agents.

The comparatively recent introduction of radium has led to a revolution in the methods of treating cancer. While surgery has many loyal adherents, whose authority is too great to be lightly disregarded, while x rays have proved far too valuable to be counted out of any reckoning of our therapeutic armament, still the "cloud of witnesses" testifying to the ever widening possibilities of radium increases daily. There is every reason to believe that the next ten years will see a great reduction in the present high mortality rate of cancer through the application of radium.

We must, of course, be cautious in placing too much reliance upon any one method new or old. With radium, especially, there is still so much to learn, so great an improvement in the technic of its application is possible, that we must be especially cautious. The operator must be very skillful, and he must have a sufficient amount of the element on hand to assure a sufficient dosage. This is often overlooked, and is likely to be misunderstood by the general practitioner referring patients for radium treatment.

Throughout this paper an effort has been made to emphasize the need of impressing upon the public the need of *early* diagnosis and *immediate* treatment. Now that we can often hold out promise of a cure by other means than the knife, and assure the patient that he will not be obliged to make a long stay in the hospital, with its attendant expense and inconvenience, there is good reason to believe that patients will be ready to present themselves for examination before it is too late to hope for a cure. Even if the case is first seen too late to hope for permanent relief, the use of radium can do much to make the remainder of the patient's life endurable by ameliorating the pain, healing ulcerations, arresting hemorrhage, lessening the discharge, and generally improving the physical condition.

4 WEST SEVENTH STREET.

The author's conclusions and references will appear in his reprint.

Dermatology and the Nervous System

By GEORGE H. HYSLOP, M.D.,
New York.

In attempting a brief article on the topic selected, the common field of neurology and dermatology, one can scarcely more than enumerate the common diseases and symptoms in which the interests of the two branches of medicine overlap. A simple classification will perhaps best demonstrate to the general practitioner, as well as the specialist in either of the two fields, that no one branch of medicine can be independent. And it will serve to emphasize the fact that no specialist is competent unless he possesses broad interests and fairly wide information in departments of medicine other than his own chosen field, even if the interest is superficial and knowledge limited to practical things.

In the Iliad, the "catalogue of the ships" offers extremely dull reading. But in the following "catalogue of symptoms of diseases" one may find something of useful nature, which will render the reading less soporific.

Among clinical material of interest to both dermatology and neurology are pigmentation changes, disturbances in sweating, abnormalities in quantity and distribution of body hair, trophic phenomena, certain skin eruptions and inflammations, and one variety of tumor.

The skin may show a lack of pigmentation, generalized or circumscribed. Vitiligo, leucoderma, and scleroderma show such decrease. The causes of these skin diseases have not been established, but in scleroderma thyroid feeding has been found useful, and in vitiligo the fact that the patches may have a distribution corresponding to spinal segments suggests a spinal cord origin of the disease. Leucoderma must at times be differentiated from the white patches of anesthetic leprosy. In the former, pigment increase may be found at the edges of the white spots; in leprosy the borders are apt to be red, as if inflamed, and the centres anesthetic. In syringomyelia and in chronic peripheral neuritis the skin in the affected nerve areas may be without pigment, quite smooth, and glossy.

Increase of pigmentation is seen in a variety of neurological diseases. Pellagra and Addison's disease are first called to mind, as in them the pigmentation is quite characteristic. In certain instances tumors of the spinal cord may produce a pigmentation limited to one or two segmental areas, corresponding to the site of the tumor. In acute inflammations of the spinal cord a similar phenomenon occurs, which is in like manner of localizing value.

In subacute combined degeneration of the cord (combined sclerosis) it is common to find that the skin of the lower extremities appears smooth, glossy, and with a yellowish tint. The yellow tint may extend over the entire body surface when the disease is secondary to pernicious forms of anemia. But in cases in which severe anemia is not a causal factor, but in which there is a chronic disorder of digestion, it is not uncommon to find the skin of the trunk, and particularly of the abdomen, darker than that of the extremities. The discoloration will decrease when gastrointestinal functions are improved. In disease of the abdominal sympathetic the same symptom has been noted.

As in vitiligo, the distribution of nevi may correspond to areas supplied by segments of the cord or by peripheral nerves.

Erythromelalgia and Raynaud's disease should be mentioned first among diseases producing vasomotor disturbances. They may also cause abnormalities of pigmentation and trophic manifestations. Marked dilatation of the small veins of dependent extremities may be seen in these diseases.

In migraine the flushing of one side of the face during an attack is helpful in diagnosis.

Hyperidrosis may be generalized or localized. Epidemic encephalitis frequently causes excessive sweating, which may be limited to one half of the body, or even to one side of the face, or to one extremity. In young children hyperidrosis is by some authorities regarded as a vagotonic sign. Psychoneuroses, particularly anxiety neuroses, seem to provoke an unbalance of the vegetative nervous system which is responsible for the cold, cyanotic, and moist hands and feet. The hyperidrosis of hyperthyroidism is known to everyone.

In irritation of nervous or spinal roots, excessive sweating may be confined to the area supplied by the parts irritated. In cord tumors the level of sweating disturbance is of localizing value.

Generalized anidrosis is found in hypothyroidism. Localized absence of sweating occurs in destructive lesions of nerve trunks, and is part of the syndrome of injury to the cervical sympathetic.

Angioneurotic edema, the hereditary edema of Meige and Milroy, dermographia, and *tache cerebrale,* all evidence disturbed vasomotor control. Hysteria, other psychoneuroses, and toxic states are associated with blanching and also hyperemia of the skin stroked by the fingernail or a sharp object. This vasomotor sign has been used to determine whether a given patient has sympathetic overaction due to endocrine disturbance, but its value is questionable.

BODY HAIR.

Davis (1) has noted that in male syphilitics with hypotrichosis, or signs of status lymphaticus, paresis seems to develop less frequently and when it does occur its course is less rapid than in normal or hypertrichotic individuals. In underactivity of the pineal body, early puberty and hypertrichosis are among the diagnostic features. In patients with symptoms of a cauda equina lesion, the presence of a wisp of hair in the midline over the lower part of the sacrum may indicate that spina bifida occulta is the underlying condition.

There are several common neurological diseases in which decrease of hair may be found. Chronic neuralgia and neuritis will cause loss of hair in peripheral nerve areas. Hypothyroidism of slight degree may manifest itself by falling of hair from the scalp and eyebrows. In cretinism and myxedema the hair is scanty, dry, and coarse. Facial hemiatrophy will cause loss of hair on the affected side of the face, even the scalp, too.

Not so long ago a patient was presented before a clinical society as a case of syringomyelia. An observant dermatologist noted the absence of eyebrows, found on inquiry that it was recent in origin, and therefore suggested bacteriological examination of the nasal secretions. This being done proved that the patient had leprosy. While such a differential diagnostic problem is rare, it illustrates the importance of little things, the necessity of seeing everything when examining a patient.

The puffy hands of brachial plexus or lower cervical cord lesions do not take an important part in diagnosis as a rule. But pain in the arm, with vasomotor disturbances and swelling in the hands, should make one think of cervical rib, or perhaps pressure from metastases in the cervical lymph nodes.

Trophic sores and ulcers are found frequently in diseases of the spinal cord, and also in severe lesions of the peripheral nerves. The perforating ulcers of tabes and of socalled diabetic neuritis are familiar. They also occur in spina bifida occulta. But in many cases of socalled sciatic neuritis, impossible to relieve by treatment, the presence of sacral trophic sores will prove that instead of a neuritis, there is spinal cord or equina disease. Multiple sclerosis, involving only the spinal cord, may be differentiated from multiple neuritis by the same signs.

Syringomyelia should be thought of when one sees a painless gangrene of one or more fingers. The gangrene of Raynaud's disease and of erythromelalgia is quite characteristic. However, symmetrical gangrene associated with tetany symptoms will suggest chronic ergot poisoning.

Neurofibromata may metastasize in the central nervous system. A common site for such a secondary growth is in the region of the auditory nerve. Therefore, in cases in which tumor of the cerebellopontine angle has been diagnosed, the feasability of operation may depend upon an examination of the skin. The same principle holds true with regard to melanomata, but since they may metastasise anywhere in the brain, and grow rapidly, the need for caution is different.

INFLAMMATIONS AND ERUPTIVE LESIONS.

Herpes zoster is of special interest to the neurologist. When the trigeminal nerve is involved, the herpes may be caused by basal tumor, or meningitis due to cranial sinus infection, syphilis, or tuberculosis. Herpes is not infrequently associated with tumors, degenerations, infections, and inflammations of the spinal cord. Of the degenerations, tabes may effect not only the posterior columns but also the meninges, and therefore is most likely to be complicated by herpes. It may occur in subacute combined sclerosis, but is seldom found in multiple sclerosis or in Friedreich's disease. In considering a localized inflammation of the cord or meninges, it should be remembered that such an inflammation may be secondary to disease of the vertebral column. Arsenic poisoning as a possible cause of herpes should never be overlooked by dermatologist or neurologist.

There is no opportunity here to enter into all the forms of syphilitic skin lesions. Mention alone should, however, carry its message.

Of other eruptions and forms of dermatitis, perhaps only a few come within the scope of this paper. The eruptions caused by certain drugs—veronal, copaiba, luminal, arsenic, iodides, and bromides—are of interest in that these drugs are a valuable part of the armamentarium of the neurologist. The eruption of acute epidemic meningitis is not often seen in New York city but cases of meningismus early in the course of fulminant infection occur frequently enough to make the presence of an eruption a valuable diagnostic aid.

Tuberculous meningitis, in the first few days, is exceedingly difficult to diagnose. In adults, brain tumor, syphilis, epidemic encephalitis, and chronic uremia must be ruled out. In children, malnutrition may deceive. But various authors have described in tuberculous meningitis a dermatitis of the head, and a macular erythema of the extremities. The existence of a chronic form of tuberculous skin lesion has helped in two instances I can recall.

Finally, one may again mention pellagra, cited already in the paragraph discussing pigmentation changes. This disease occurs rarely in New York city. But its skin manifestations are so characteristic that they should not be confused with the eruptions of other conditions such as scurvy, or chloasma with scabies in a pregnant woman—as has occurred recently.

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141 West Seventy-fifth Street.

The Temple Offerings to Aesculapius

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When we attempt to trace the heredity of the curious custom of offering in the temples of Æsculapius images of the diseased organ in gratitude to the god for relief from the affliction which had been cured by the more or less direct assistance of the divinity, we meet with a noteworthy but not insurmountable difficulty in clearly associating its origin with some of the rituals of black magic, widespread among primitive men, which formed such an important part of their contact with supernatural powers. These offerings were acts of gratitude or propitiation, as we gather from ancient records. The direct descent from the witch work of the tribal wizard is not, so far as I have been able to judge, demonstrated with entire satisfaction, but I have no doubt of their affiliation of thought with that part of it sometimes called sympathetic or homeopathic magic. In Queen Elizabeth's day it was still not infrequent for an enemy to make a dough image of the hated person. A bodkin was thrust through the region of the heart or other suggestions made to the evil powers of what was hoped would happen to him. Lead, too, was a convenient material and, still more adaptable, wax was used to make the image or whatever other object, which in the art of the mischief maker was supposed to suggest the object of his hate. It is more often reported in the preceding reigns but it is even said that in the early years of the good Queen Victoria such witcheries were plotted against the sovereign. Occasionally we read accounts of such things nowadays among the negroes of our own southern states and still more of Hayti and they are commonly enough reported by modern travelers among primitive people.

The wax or dough or lead manikin or other witch stuff is not exclusively employed in working evil upon enemies. Far from it; white magic makes use of the same agencies to altruistic ends. Such things are used among the Malays (1) to decoy wandering souls back to the body, the image having been connected, in some direct or indirect way, with the person suffering from bodily afflictions due to a wandering soul. There has apparently to be some sympathetic influence established between the witch stuff and the patient or victim, as the case may be. Nail parings and the shorn hair are the common objects of materia medica for the wizard and it is to the way he uses them that is usually ascribed the beneficient or maleficent effects. We get the drift of the primitive man's pantheistic idea. Influence the power in these for good or evil and through the spirit which pervades the universe the influence seeks its like and helps or harms its affinity. They do not reason things out by such abstractions, but that is the instinctive underlying sentiment. Savage people are apt to think of almost anything as having an affinity, anything the person may have touched for instance has been imbued with the effluence from his embodied spirit, but of all things an image of the person is full of it; a drawing, on the cave walls, for example, of an animal is helpful to the primitive hunter of it. He acquires some influence over it. A man's shadow is his ghost, the effluence of his soul. You tread on the shadow and you insult or hurt the man it belongs to.

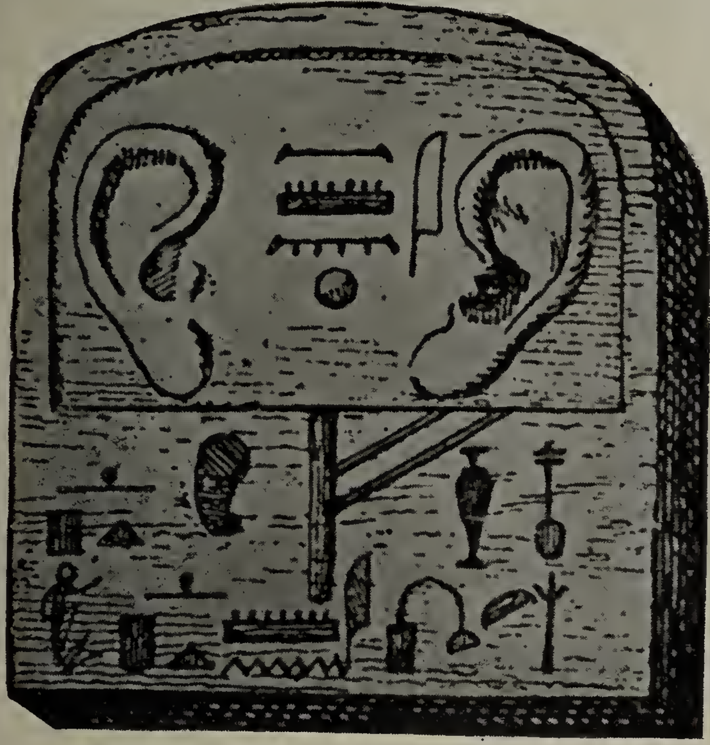

Fig. 1.—Offerings to Ra in return for successful treatment recorded on a stele 1500 B. C.

Out of these fundamental tenets of primitive thought springs the belief that he who can cure disease can cause it. We see it is all quite logical and we see we differ from primitive man only in the nature of our theories. Many of us if forced to choose are still pantheists silent or avowed. Now if we could suppose these temple images were a contribution to the cure and after it was effected were left behind in gratitude to the god who cherished them, to help him with the next case, we would get a clue to the further working of the human mind, beginning to be tinctured with modern altruism, but we must be chary of accepting this for antiquity. It began late. How, too, are we going to imagine that any god of good taste would care for a lot of old images of cancers and crooked limbs hung along his temple walls? Man has always made his god, and the common idea of primitive man and of men of the ancient civilizations was at the very best the gods had only a languid interest in the happiness and welfare of mankind, many insisted none at all. However, I do not think that can be accepted too absolutely. We have to suppose something of the kind behind white magic even and the gods had their favorites. Zeus was the father of many of them and the rest of the divinities had their share in the parentage of heroes and were interested in them, but this ascription of universal benevolence to Æsculapius is not to be lightly undertaken.

It is extremely difficult to force the explanation of these offerings into the limits of Miss Harrison's "do ut des" principle (2)—"I give to the god that the god may also give to me what I desire." We may indeed give to the god something he wants for chasing away something we do not want, but what is there in it for the god of antiquity to have a lot of graven plaques on the walls of his corridors? We, as Christians, say God so loved the world He sent His only Son to save it, and we can easily imagine Him pleased with a helpful spirit as He might be in our supplying a god with talismans to cure disease according to the primitive pantheistic principle, but that is an assumption for which we have otherwise little warrant in ancient theology. For the most part the Olympians resented such interference. Zeus struck several, men, heroes, even gods, for doing too much for man, giving him fire, restoring him to life, and what not.

There is a book of Coan Prenotions in the Hippocratic Corpus. Many if not all the maxims therein found are said to have been engraved on temple walls at Cnidos and Cos. Hippocrates is supposed to have got some of his education from them. What were they for? Inscriptions for gods or men? Are we permitted to imagine that these representations of tumors and ailing ears belonged in the same category? We can scarcely avoid the inference as to this any more than as to their earlier affiliation with witch stuff. These ancient temples, in which the Æsclepiadæ found a home and an employment, some of the shrines only we may assume, are said to have been gradually turned into Iatria, a sort of combination of dispensary and doctor's office. In other words, they began as temples of religion and became temples of science. This is in accord with all we know of the evolution of primitive medical thought. We may thus imagine the temple offerings and the inscriptions of case records on the walls mark the path entered on the road to such changes, But these votive offerings as I have already more than intimated surely go back into the mists of primitive life for their origin. In principle the same may be said for the inscriptions. Those at Epidaurus were most of them records of medical miracles, though some of the Coan prenotions contain the vision of the ages, and these pictures of pathology are indeed humble ancestors for the glories of modern pathology. We cannot avoid thinking of Lourdes and its cures, but it was through such gropings that the Æsclepiadæ finally found the way that lead to Rokitanski and Virchow and Pasteur.

As has been said the witch can use the image for black magic or white, the doctor can use his strychnine for a tonic or a poison. The medicine man can use the image to get the soul back or sticking a pin into the liver it becomes malevolent in the etiology of hepatic disease. The Malay bad man crones out in a ditty the rationale of his performance:

> "It is not the wax I slay,
> But the liver, heart and spleen of so and so."

Yet the image, too, he uses as a love charm. He floats the portrait of his lady from the bough of a tree and by winding it with a thread of seven

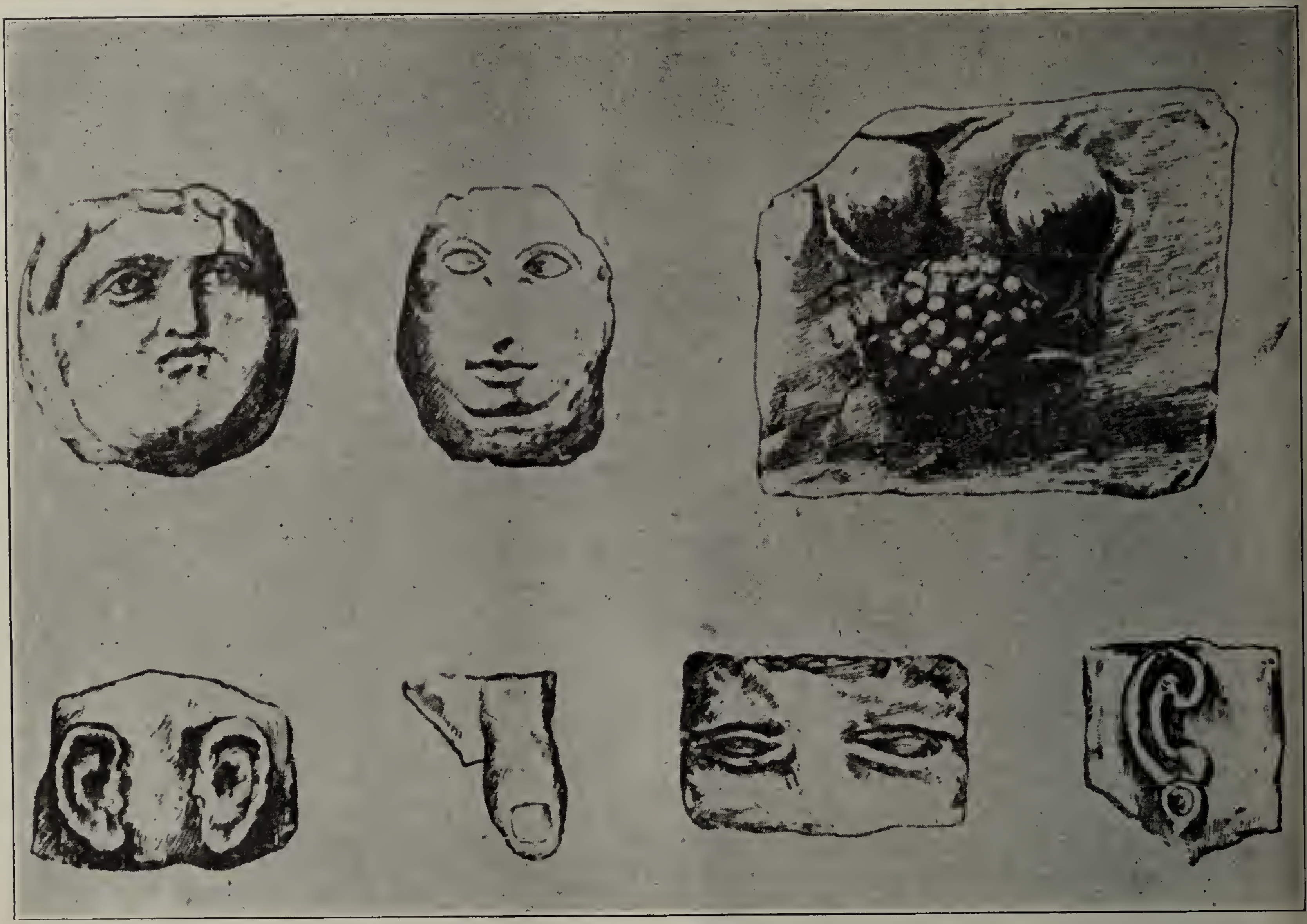

FIG. 2.—Greco-Roman votive offerings, given in a spirit of gratitude to the god, in commemoration of his many triumphs.

strands of seven colors he causes her heart to yearn in love for him. It is a love charm and a soul enticer and a deadly menace according as it is manipulated. By it he can become triumphant over the difficulties and perils of life, among them disease.

Everything in the mind of the first reasoners was referred to general causes. Did a man cut his foot? It was through the black magic of an enemy, perhaps putting glass in his footsteps behind him, that brought it about. It was not the thorn in front of him; that was the proximate cause, perhaps, but back of it lay the magic. Could the primitive mind be satisfied long to regard the image of a whole man properly representing an ulcer of the shin? The man was otherwise very well. If the ulcer does not get well we must turn to something more efficient. If the ulcer is to be treated you must capture the local power that resides in it. A local manifestation necessarily calling for a local cause does not appeal very strongly to the modern medical mind but it made still less of an appeal to the primitive mind until advancing differentiation had reached a certain point and then doubtless it was too often in the sequel that general systemic causes were neglected. We get such a hint again in the Malay Peninsula. One of the highly prized articles of female attire are large hair combs, somewhat such as our great grandmothers wore, if we are to believe the old prints. But these are valued not so much for their ornamental attractions as for their magic or talismanic powers. Some are formed in panels, each one of which may represent some part of the body that may be affected.

In Egypt in early legends we find the same primitive thought. Isis makes a clay image of Ra out of mud, in her struggle to usurp his divine power (4), mixing it with her spittle which is a part of the magic of the upper Nile tribes today, but as early as 1500 B. C. we find recorded on a stele an offering to Ra of the figure of an ear (Fig. 1) in return for the success of the god in treating it. In setting up such figures, as in statues today, the very act of setting them up is an honor, testified before men, and doubtless this came to be also a motive in the desire to placate or in gratitude to the god, thus commemorating one of his many triumphs, and this must not be lost sight of in a study of the Greco-Roman votive offerings (Fig. 2). But in Egypt it was eye disease which, through all the ages of prehistoric and of historic times, has been preeminent in the annals of Egyptian medicine. The young god Horus in a battle with the old god Set lost an eye and the eye was thus symbolized in legend, without doubt because of the endemic trachoma. Prosper Albinus said hundreds of years ago that when a west wind blew, half of Egypt wept. How much of this is due to the blowing sand and how much to something else we will not stop to inquire. Suffice it to say that the eye of Horus entered into all the incantations and other magic rituals in Egypt whereby eyes were to be cured. The fame of the Egyptian eye doctors in the remotest times spread to Babylon (5), but there as in Egypt the earliest images were those of devils who typified a general power over the system of man for good and for evil (6), at least until the rise of hepatoscopy when images of the liver begin to appear.

While, therefore, we have been able to trace in outline the evolution of thought inherent in the temple offerings back to the early ideas of primitive man and have found traces of them in the older civilizations we are for the most part thrown upon the archeological evidence of its much greater prevalence in Graeco-Roman temple practice. Evidently the underlying idea of demon possession, or at least its anthropological embodiment became, with the advent of Greek thought, much obscured. We find no trace of it in the Hippocratic Corpus, except in the bitter diatribe of the Sacred Disease and but for this we would not understand what Hippocrates in the more genuine treatise of *Ancient Medicine* has in mind in one or two of the sentences. In some of the manifestly spurious books, such as that on dreams, we get the superstitious side of Greek medicine, but it is astonishing how little we get in the books which for other reasons are regarded as genuine. We can, indeed, trace many ideas even of our own back to those of primitive man, but his ideas in no way obtrude themselves in the works of Hippocrates in such an evident manner as these temple images. These, for the most part, we owe to archæological research and the dreams in the temples are referred to chiefly by nonmedical writers, until Galen treated them seriously, but Hippocrates, before whose eyes on temple walls these images as well as the instruction of the inscriptions must have daily presented themselves, ignores them. They stood with him very much as they stand with us, relics of superstition or the aberrant vagaries of untrained and low grade minds. Before his day, however, the differentiations of organic pathology had begun in this crude way. To what a height that differentiation effloresced in the fertile Greek mind along with much else that is not wholly dross in the evolution of medical thought and which received so mighty an expansion from Greek genius, is to be seen in the better works of the Hippocratic Corpus.

In the temple of health at Palaikastro (7) in Crete there were ex voto figurines found, some perhaps offered to the divinity by patients with breast cancers and some representing paralysis. The ruin of Cretan civilization and the destruction of Knossus took place before the Trojan war and probably some two hundred years only after the date ascribed to this Egyptian offering (Fig. 1). In the time of Solon (600 B. C.), the Greek cities are said to have sent to Crete for the thaumaturge, Epimenides (8), who rendered great service in amending their laws and religious rites, and Thaletas, Cretan born, carried the music of his native land to Sparta, according to Plutarch, and put an end to a terrible epidemic among the Lacedemonians (9). We know that temples and palaces flourished in the Cretan civilization nearly a thousand years before Solon, so the temple offering Erman reproduces as an indication of life in Egypt in 1500 B. C. had its counterpart in the land whence, according to its own legends, Greece drew upon the arts of medicine, music, and religion.

As was shown for the serpent of Æsculapius (10), we are justified from archæological records in surmising many of the characteristics of the Greek temples came from Egyptian and Babylonian sources, but if we think of such things springing from any one or more centres we must suppose Crete was one of them, closely affiliated with the others or possibly acting as a stepping stone across the intervening sea from the other continents of the eastern hemisphere to Europe. Paleology teaches us that the current of ideas and of race migration was perhaps not always in this direction, and we must get away from the thought that migration and the diffusion of civilization took place under the terms of these conceptions. It was a slow process. Its tide ebbed back and forth and for thousands of years we must think of an Ægean civilization as only a part of the culture which covered the basin of the Mediterranean. Perhaps never before the era in which we are living was there as much disparity as now exists among the nations dwelling around it. In this sense, then, serpent worship and temple offerings may be looked on as chthonic, springing out of the soil of Greece itself, rather than carried thither by any surge of population across the sea or around its land stretches.

Egypt owes its reputation for antiquity largely to its climate and its geography, not in the sense of its evolution of civilization so much perhaps as in the durability of conditions of sky and land and the unchanging temperaments of its dwellers which preserved the records for us. Beneath the ruins of Palaikastro in Crete lay buried the temple offerings and the image of the Snake Goddess almost as long as the record of this ear offering to Ammon-Re. Whatever such things may have been in the beginning, though they may once have been mere magic stuff for the wizards of primitive man, though they may have hung up in the temples of the gods or the palaces of kings to glorify the works of a god, we must look upon them since the Hippocratic era as in a degree affiliating themselves with the temple wall inscriptions as instructions to succeeding generations. With the rise and diffusion of the art of book making their importance declined gradually, but they were extinguished as characteristics of the temples of Æsculapius only when his cult disappeared before the advancing triumph of the religion of Christ in the cradle of civilization in the basin of the middle sea.

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Editorial Articles

ACUTE PHTHIRIASIS

Textbooks on dermatology describe phthiriasis a rather univocal way, namely, papules of prurigo, cutaneous pigmentation, and lines due to scratching predominating over the shoulders and waistline. The symptomatology of this parasitic affection is most varied and one of the most curious and interesting is what Milian has termed phthiriasic roseola as well as the form to which he has given the name of acute prurigo.

Phthiriasic roseola is occasionally met with in the form of an eruption of red spots thickly scattered over the trunk and resembles syphilitic roseola, and in reality this is the first diagnosis that is thought of. But close examination reveals differences. The eruption is composed of small round or oval spots the size of a pin head or lentil, bright pink or a tender red color, disappearing on pressure and then reappearing like any erythematous spot. With a lens a small central point will be found in some of the spots—the trace of a bite—but this is most exceptional. The macules do not usually project above the surface of the skin, but occasionally they are slightly raised and hence assume the aspect of a small edematous papule. The apex does not present a vesicle as in strophulus, or a scab as in prurigo. The elements are scattered haphazard over the trunk with circinate grouping or any determined direction with the long axis of the macular lesions. In places the elements are somewhat confluent, being agglomerated in groups of ten to twenty.

The seat of the eruption exists on the trunk and limbs, the face remaining intact. On the trunk the roseola presents the usual maximum of phthiriasis, namely, on the shoulders and waistline. It also exists on the lateral surfaces of the trunk where it is practically always present and offers a very characteristic distribution that may be regarded as pathognomonic. It is marked over the flanks like syphilitic roseola and is likewise observed in more or less numerous groups below and behind the axilla, in the region immediately subjacent and posterior wall of the axilla. The group of erythematous spots at the latter point often assumes curved lines with the concavity uppermost.

This special localization is very characteristic of phthiriasis in general and is all the more important because it exists alone. Its pathogenesis is readily explained, because the lice in the clothing are hidden in the seams and parts nearest to the body and the posterior armhole is the readiest location from which the parasite can attack the cutaneous surface. As in all cases of phthiriasis, pruritus is most intense at night, especially when the subject is warm in bed.

Acute phthiriasic prurigo is perhaps a little more frequently met with than the roseola. It is encountered in the form of pinkish papulovesicles the size of a pin head, disseminated haphazard over the entire cutaneous surface, but especially on the back, posterior surface of the upper limbs and anterior aspect of the lower limbs. This is the clinical picture of acute prurigo simplex. Occasionally some spots of erythema or urticaria will be found and these present the central bite of the parasite.

It is probable that many cases of socalled acute prurigo simplex—included among autotoxic or other like affections, are really this form of phthiriasis. The evolution of phthiriasic roseola is usually rapid and is cured in a few days. It is an accidental affection of cleanly people resulting from a rapid invasion by the parasite. The treatment is that of phthiriasis in general, namely, sulphur baths, a change of linen and disinfection of the clothing.

THE ETIOLOGY OF CUTANEOUS PIGMENTATION

The pathogenesis and etiology of cutaneous pigmentation is unquestionably interesting but little known, and the divers notions we possess are hypothetical. The appearance of dyschromias seems to be related to external and internal causes, the former being the varieties the best understood. It is known that any irritation when somewhat intense and prolonged, can give rise to pigmentation of the skin but as Darier has pointed out these pigmentary disturbances have for the most part the character of vital reaction against an irritant, and their manifestations and intensity will depend less often on the nature of the causal agent than on the reactionary tendency of the subject.

Among the irritating causes, physical agents play an evident part. For example, the production of sunburn is principally due to light and in particular to chemical rays. Heat may be the factor in some cases and Neisser incriminates the caloric action of furnaces in cases of syphilitic dyschromia occurring in blacksmiths and bakers. In the same way, mechanical agents can give rise to pigmentation, or at least play a secondary part as a localizing agent. Vitiligo and the socalled primary pigmentary syphilide are frequently localized in areas chronically initiated, as has been shown by Thibierge and Finger.

Finally, to conclude with the external causes, beside the parasitic dyschromias whose etiology seems to be complex, it may seem logical to include those which are secondary to the dermatoses, such as the bullæ of pemphigus, herpes, zona, boils, papulonecrotic tuberculides, and other conditions, as well as syphilitic lesions—the macula of roseola, secondary papules and ulcerating lesions are the starting points of pigmentary change in which either a melanodermia or a more or less atrophic leucodermia are observed.

But still other causes of dyschromia have been invoked, both general and internal, whose mechanism has been diversely interpreted. Among them hyperemia should be just mentioned which unquestionably intervenes in the pigmentations having a local or external cause, for example the melanodermia occurring on varicose limbs. Lesions of the suprarenal capsules have for some time been recognized as a cause of the melanodermia of Addison's disease but there is some question as to what extent renal insufficiency or lesions of the pericapsular nervous plexus act as factors. If suprarenal insufficiency be incriminated it should be pointed out that normally the suprarenals destroy pigment or a pigmentogenous substance and that when diseased they cannot do so. Or if the sympathetic theory be maintained, it will be said that when irritated a hyperactivity of the cells secreting pigment occurs.

The sympathetic and cerebrospinal systems undoubtedly play a part in many dyschromias, as in leprosy, vitiligo and the socalled primary pigmentation of syphilis. The latter does not belong exclusively to lues because it has been observed in tuberculosis and chlorosis. On the other hand, in many ways it is similar to chloasma of pregnancy and Addison's disease and it may well be asked if the syphilitic dyschromia is not also consequent upon some disturbance of the pericapsular nerves resulting from the Spirocheta pallida.

Other dyschromias have been regarded as due to hematic changes, such as malarial melanodermia and perhaps bronze diabetes. According to Diday the blood of syphilitics undergoes a peculiar change in its coloring matter which allows it to become deposited in the tissues. If for any reason a congestion arises with a consequent increase of the blood in the skin it will progressively infiltrate the integuments and finally the coloring matter will come near enough the surface to produce a perceptible change in the hue. Petresco likens the mechanism of the pigmentary syphilide to that observed in paludism; there is an exaggerated deposit of hemoglobin coming from the destroyed red blood-corpuscles, hence melanin and its deposit in the tissues. Other observers have thought that the presence of bile pigments in the blood might be the origin of a number of dyschromias and perhaps syphilis which does not spare the liver, produces pigments in this way. Finally, certain disturbances of pigmentation have a toxic origin, such as arsenical melanodermia and argyria.

Although the etiology of dyschromia is poorly understood this process can be divided into primary and secondary types. The first—or spontaneous type—is not preceded by any eruptive element. On the contrary secondary pigmentations are those succeeding an eruptive element which was seated at the spot where the dyschromia — melanodermia or achromia according to the case—ultimately arises. In the first group can be placed the melanodermia of Addison's disease, lentigo and cholasma of pregnancy. In the group of secondary dyschromias are the melanodermias or achromias following some local dermatosis, such as pemphigus, lichen planus, varicose ulcer, and other conditions.

ENDOTHERMY

The following notice in the London *Lancet* for June 3, 1922, shows a marked appreciation of the work done by Dr. George A. Wyeth, reports of which have appeared in this Journal:

In a preliminary report Dr. George A. Wyeth draws attention to this method of treatment of accessible malignant growths, emphasizing some of its outstanding advantages. Endothermy is the production of heat in the tissues from within, the active electrode being cold when applied, the process differing therefore from other methods of cauterization by heat. The treatment may be employed in two forms: desiccation, obtained by the monopolar current, with high voltage and low amperage, admitting of extremely fine work, e. g., in the cornea or in the vocal cords; and coagulation, obtained by the D'Arsonval or bipolar current of low voltage and high amperage, for lesions of larger size and greater depth. The first step in the procedure is to describe in the healthy tissue outside the malignant area a ring of coagulation necrosis shutting off and destroying the bloodvessels and lymphatics leading to and from the diseased area, after which the growth itself is completely destroyed in situ by dividing it into small sections which are then coagulated or desiccated piecemeal. The tumor having thus been destroyed, the debris are recovered by curetting or otherwise, and the resulting clean base receives a final application of the current. As the process enables the growth to be removed as a necrotic mass instead of as a group of viable cells, the risks of metastases and of recurrence are greatly reduced, while the destruction of the sensory nerves which incidentally results from the ring of necrosis gives immediate and lasting alleviation of pain in inoperable cases. Dr. Wyeth points out that if the work is properly done there should be no hemorrhage whatever, but that as a secondary hemorrhage may occur in isolated cases a preliminary ligation of any important bloodvessel in close proximity to the growth might be advisable. The value of endothermy in socalled inoperable carcinoma is said to be great, owing partly to the alleviation of pain, partly to the sterilizing effect of heat upon a foul discharging area, and partly to the improvement in the general condition consequent on a return to more or less normal diet. Details are given of four cases satisfactorily treated by endothermy, two by desiccation under local anesthesia, and two by coagulation under general anesthesia, the photographs testifying to the excellent cosmetic effect obtained. While Dr. Wyeth does not feel justified in using the word cured in relation to any of the cases, the reports are encouraging as far as they go; and the applicability of the method to various precancerous dermatoses such as lupus vulgaris, lupus erythematosus, x ray dematitis, and papilloma, as well as its use in malignant disease, both operable and inoperable, suggests for it a wide field of usefulness.

BOTULISM

The first outbreak of botulism in Great Britain occurred at the Loch Marce Hotel in Scotland a short time ago and resulted in eight deaths. It is somewhat of a coincidence, and a fortunate one from the point of view of medical science, that early last year Sir George Newman, chief medical adviser to the Ministry of Health, together with the Medical Research Council, made arrangements for the fuller investigation of all food poisoning cases. As said before it appears that this is the first case of botulism that has been known in Great Britain although this form of food poisoning has occurred in Germany and in this country on several occasions. Indeed it was first recognized in Germany. It was at one time fairly common there and in 1896 van Ermengem isolated the causative germ to which was given the name Bacillus botulinus. Up to 1906 the condition was not heard of to any extent but in Germany, and then a series of outbreaks were recorded in the United States and have continued at intervals up to the present time. However, the outbreaks have exhibited decided dissimilarity from the causative point of view in Europe or rather in Germany. The cases were always associated with the consumption of meat, so much so that the infection was given the name of sausage poisoning. In this country, on the other hand, canned or bottled fruits or vegetables, generally put up at home, have been traced as the cause. Moreover, these outbreaks, as a rule, have been confined to California or one of the Western States. California has been mainly the State in which botulism has been most prevalent. Valuable investigations on the subject have been carried out by American investigators, who have shown that there are two distinct types of toxin, A and B, and that the antitoxin of type A, for an antitoxin has been discovered, affords no protection against the toxin of type B. The antitoxin usually prepared from the goat if employed soon enough, exerts a satisfactory action. As there are different types it is obviously necessary that polyvalent sera should be used. Undoubtedly more will be learned concerning the bacillus of botulism in the near future, which by the way is a saprophytic anerobe producing its toxin outside the animal body. Science has proved already that properly prepared canned or bottled foods offer no menace. Regarding canned fruits or vegetables, the cans of which the contents are dangerous supply sufficient warning in their own bad physical condition. As for preserved meat or other foods the question calls for further investigation. The Loch Marce cases were due to contaminated food paste, and, of course, investigation will be chiefly directed to this form of preserved food. In these days when canned and preserved foods of every kind are so largely made articles of diet, it is essential that every means should be taken to render them safe foods.

THE POLICY OF HONESTY

It pays to advertise, provided the advertising is of the right sort. It sometimes undoubtedly pays to misinform the public and exaggerate the wares one has to offer, but it does not pay for long, and articles so heralded soon disappear from the market. It is gratifying to note the good sense displayed of late by certain manufacturers of dental pastes. Instead of making extravagant claims for their mouth alkalinizing and their digesting or sterilizing properties, they are saying only that the substances they offer are good cleansers.

The assertion that any material used for only a minute could change the reaction of the fluid of the mouth from acid to alkaline for the rest of the day, or for even ten minutes, is absurd on the face of it. The same is true for the assertions so often put forward with regard to bactericidal properties. By assisting in the removal of food caught on or between the teeth, temporary breeding centres for bacteria are destroyed, but the effect of the use of brush and of dentifrice is here almost wholly mechanical.

The problem of mouth hygiene is something vastly more complicated than can be solved by the use of a brush and any substance used with the brush, no matter how much thought and ingenuity has gone into the making of either. Pyorrhea and caries develop in mouths that are scrupulously scrubbed with the very most up to date brushes and pastes, and they do not develop in mouths which have never known either paste or brush of any kind. Nevertheless the use of these cleansing agents would seem to be of value, even if their prophylactic effect is considerably more limited than some makers of tooth pastes would have us believe.

Furthermore, the more efficient these cleansing substances the better, and even the more pleasant they are is of moment, the latter quality conducing to their more frequent use. Many makers of drugs might emulate, to advantage, the honesty of some of these makers of dentifrice.

PUBLIC HEALTH EDUCATION

The success of all progressive reforms depends on the attitude of the public. This was recognized in antiquity and Plato gives expression to it in his writings on the structure and functions of the ideal state. The consideration of the inarticulate masses has no doubt become an even more important matter in modern times. In no department of public activity is popular appeal more essential than in matters appertaining to public health. One may certainly state that the education of all sections of the public in this subject promises a richer reward than any other single endeavor in the domain of medicine.

For these reasons the City of New York and its Department of Health may be congratulated on their progressive program of public health lectures. The response to previous endeavors has encouraged the authorities to increase the scope of their work. A perusal of the syllabus shows that a large variety of topics are to receive attention in the coming season. Among the list of individual diseases one misses a special provision for tuberculosis. Otherwise, the program appears to cover most of the outstanding problems of the preservation of health and the prevention of sickness.

One group of lecturers is devoted to special affections such as the socalled killing diseases, nephritis, diseases of the circulatory system, and cancer. Of particular interest should be talks on personal hygiene and allied topics of broader social significance, such as eugenics, venereal diseases, and sex education. The subject of preventive medicine is represented by lectures on preventable diseases. In this connection the cycle of five lectures on child welfare may also be mentioned. Prenatal care is the topic of one of them and one can only hope it will receive the attention it deserves. No doubt, in prenatal supervision lies the chief hope of reducing the mortality and the appalling morbidity associated with pregnancy and the puerperium on the one hand, and with the dangers of infancy on the other. It is quite true that the increased expectancy of life during infancy is one of the proudest achievements of public health activities. The need of more strenuous efforts for the care of women during pregnancy is great on account of the general ignorance of the public. How long shall we have to work and educate, until it will be considered criminal negligence on somebody's part for a woman to reach a stage of advanced toxemia before she comes under medical supervision?

Closely related to this topic is the unsolved problem of the optimum arrangements for the care of women during labor and the puerperium. From time to time this question forms the subject of discussion at obstetrical meetings in various countries. The persistently high mortality and morbidity is thought to be due to interference by untrained help or to faulty obstetric technic. It is rather plain that the problem has many aspects which belong to the domain of public health. It still happens that physicians are not called in until labor has become obstructed and uterine inertia has supervened.

Another attractive feature of the program is the provision of lectures in the native languages of our most important groups of immigrants, ranging from Arabic, Greek, and Italian to Yiddish. The teaching of American ideas of personal hygiene, of that which is "next to godliness," is surely giving a broad and noble meaning to the endeavor of Americanizing the newcomers. These are good deeds which will bring their own reward in the shape of helping all to a fuller realization of the obligations and privileges of citizenship and of elevating still further the standard of health and fitness of the citizens.

ENCEPHALITIS LETHARGICA AND ITS CAUSES

A report on encephalitis lethargica has been issued recently by the British Ministry of Health. The document is a veritable storehouse of information with regard to this somewhat mysterious disease. It was first reported from Eastern Europe in the winter of 1917-18, and in Great Britain the first cases were reported from London and Sheffield in April, 1918. At that time, before investigations had been undertaken, they were thought to be related to the Bacillus botulinas. On January 1, 1919, encephalitis lethargica was made a notifiable disease, mainly for the purpose of obtaining early and complete information, not because the malady was likely to become a danger to the public. The total number of cases notified in Great Britain since that date in two years was some 1,300. This year there has been a decline, for in the first six months there were only 286 cases notified, as compared with 1,196 during the similar period of last year. The disease is computed to affect .002 to the 1,000 of the British population, and therefore can scarcely be said to be prevalent. The disease seems to be a house disease, as, according to the report, it attacks chiefly those individuals who spend the greater part of the day indoors. The occupation most commonly recorded is housekeeping. The report goes on to say that "it is not at all unlikely, however, that housekeeping, which, during the past few years, has become a difficult and disquieting occupation, is in itself a predisposing factor in the case of a disease such as encephalitis lethargica. Overwork is regarded as a predisposing cause, especially among professional and business men. There appears to be no clear relation with influenza, nor does any evidence suggest infection through the medium of house flies, or biting insects, nor through water, soil or food. It seems, therefore, that the virus "must in some manner be conveyed through the medium of the air." There is a definite theory that it is conveyed in the majority of cases by those who may show no clinical signs of the disease, or by those who are only slightly affected. It is suggested that it is breathed through the nose, and in this way affects the brain. The onset is often sudden, but in most cases the onset is gradual. First, there is headache, loss of appetite, languor, and disinclination for work or exertion followed by unconquerable sleepiness. The other symptoms are dealt with at length in the report, but there is no space here to discuss them. As the cause of the disease is obscure, it is, of course, difficult to suggest preventive measures. Valuable pathological work has been carried out, the result so far being to point to a filterable virus as the cause. A good deal more research is required before a definite cause of encephalitis lethargica can be stated.

THE MANUFACTURE OF CHEMICALS IN AMERICA.

Dr. Alfred S. Burdick, president of the Abbott Laboratories of Chicago, in an article entitled The Manufacture of Synthetic Medicinal Chemicals in America, published in the *Journal of the American Pharmaceutical Association* for February, 1922, writes of how America has won independence in the production of drugs.

Before the war the manufacture in this country of all synthetic chemicals, particularly of synthetic medicinals, was exceedingly small in spite of the fact that we had almost unlimited sources of raw materials. The salicylates, acetylsalicylic acid and salol were practically the only medicinal synthetics produced in this country prior to 1914. "If we consider this small beginning, and consider also the fact that our chemists were but inadequately trained to undertake the tremendous problem of manufacture of medicinal chemicals in this country, as compared with German chemists, whose work rested upon the secure foundation of many years of great achievement, all Americans have just reason to take pride and satisfaction in the accomplishment of the next few years."

Under the stress of war necessities, a number of American manufacturers undertook the production of the most important synthetic medicinals, perhaps a dozen in all. Many others of minor importance are still being made in Germany and not yet being produced here. Perhaps the most important of these remedies, the manufacture of which was brought about in the United States by the war, is arsphenamine, commonly known as salvarsan. The next in importance, and of greater value from a commercial point of view, is aspirin or acetylsalicylic acid.

Few physicians or pharmacists realize how much research work has been done in this country by manufacturers of pharmaceutical chemicals during or following the war, nor can they understand how great the promise is in this field, providing reasonable protection is given to this industry during the next decade." Certain dyes, particularly the flavines and brilliant green, were found during the war to have peculiar value as antiseptics. In the field of local anesthetics, apothesin, saligenin and benzyl alcohol are being produced. An important discovery in a line closely allied to the synthetic field is that of thyroxin, the active principle of the thyroid gland, by Dr. E. R. Kendall, of the Mayo Foundation. The prediction is that this will eventually be made synthetically. An interesting discovery made by Dr. D. I. Macht, of Johns Hopkins University, is that of the powerful antispasmodic, benzylbenzoate, heretofore known principally to perfumers.

"Few people realize how expensive it is to 'discover' and put on the market a new synthetic chemical. At the present time in the United States the manufacturer who wishes to go into this field must take a gambler's chance. . . . The question will arise . . . whether expenditures like this, and risks like these . . . are really worth while. We believe they are, because the future of this country in the medical field, as well as in industry, is going to depend very largely upon the collaboration between the chemist and the other fellow, and in this case the other fellow is the physician, the pharmacist, and the clinic."

REPORT OF INTERNATIONAL HEALTH BOARD.

The eighth annual report of the International Health Board covering the year 1921 has recently been issued by the Rockefeller Foundation. It covers nearly two hundred pages and is well supplied with illustrations, maps, charts and tables. During the year the Board shared in activities to promote health in sixty-three states and countries throughout the world. The greater portion of the report is devoted to the subjects of hookworm and yellow fever control as conducted by the board. An interesting account is given of the method of controlling the breeding of the Stegomyia mosquito by enlisting the aid of local species of fish to devour the eggs and larvæ. It was found that by distributing two to four small fish to each container holding ten to fifteen gallons of water the problem was simplified by about seventy-five per cent., with a lower resulting mosquito index than it was possible to get in any other way. In Peru, where a serious epidemic of yellow fever was raging in March, a drive against mosquitoes was instituted in which seventy-five thousand fish were distributed, with the result that the last case was reported on July 16. In Siam many of the ancient temples have been placed at the service of the hookworm commission as headquarters for meetings and for distribution of literature on prevention and cure of the disease due to this parasite. In Brazil the board is cooperating with the government in establishing a national department of health. This has undertaken, among other things, a nationwide program in rural sanitation and is setting up new divisions for child welfare, venereal disease control, and a crusade against tuberculosis. These various activities require the services of trained public health nurses, so a training school is being established to meet this need.

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News Items.

Bequests to Charity.—By the will of Mrs. Angie M. Booth, Flushing Hospital will receive $25,000 and Sailors' Snug Harbor, on Staten Island, $50,000.

Change of Address.—On October 1, 1922, the office of Dr. L. A. Wing was changed from 53 East Sixty-fifth street to 114 East Fifty-fourth street, New York.

Texas State.—The next meeting of the Texas State Board of Medical Examiners will be held at the Hotel Raleigh, Waco, Texas, on November 28, 29 and 30, 1922. This is the regular semi-annual examination meeting.

Personal.—Dr. Edward Wallace Lee has retired from active practice in New York city, and in the future will devote himself to consulting practice. He has been appointed Consulting Surgeon of the Erie Railroad, with headquarters at Randolph, N. Y.

Charles F. Thwing, Ph. D., president emeritus of Western Reserve University, was recently elected president of the United Chapter Phi Beta Kappa at the fourteenth national council of the society at Cleveland, Ohio.

Dr. James Rosedale Wadel Ward, ninety-six years old, born in Jerusalem, recently received final naturalization papers, and became an American citizen. Dr. Ward, who is a retired physician and lecturer, gives as his reason for becoming naturalized at such a late period in life that the United States is the only country in the world where genuine liberty of thought and education obtained.

Medical Society of Virginia, Maryland and District of Columbia.—The spring meeting of the three-state association was held in Warrenton, Va., on May 17th.

Syracuse Academy Meeting.—The next regular meeting of the Syracuse Academy of Medicine will be held at the First Baptist Church on Tuesday evening, September 19, 1922.

Yale Silliman Lectures.—This year's Silliman Memorial Lectures at Yale University, to be delivered by Dr. August Krogh, Professor of Zoophysiology in Copenhagen University, and winner of the Nobel Prize in Medicine for the year 1920, promises to be of extraordinary interest. Professor Krogh has taken for his general topic "On the Anatomy and Physiology of Capillaries," and will speak on the various subjects from October 6 to 12.

American Association of Oral and Plastic Surgeons.—The second annual meeting of the American Association of Oral and Plastic Surgeons will be held in Boston at the Boston Medical Library, Friday and Saturday, October 20 and 21. An interesting program has been arranged, and those interested in this field of surgery are cordially invited to be present. Information may be obtained from Henry S. Dunning, secretary and treasurer, 33 East Sixty-eighth street, New York.

Association of Military Surgeons' Meeting.—The Association of Military Surgeons of the United States will hold its thirty-first annual meeting in the auditorium of the Interior Department Building, Washington, D. C., beginning October 12 at 9:30 a. m. An interesting literary and professional program is in prospect, and the association will have as distinguished guests delegates from the British Naval Service, from Canada and from Spain. The officers of the association for this year are Captain F. L. Pleadwell, M. C., U. S. Navy, president; Colonel Charles Lynch, M. C., U. S. Army, first vice-president; Colonel David S. Fairchild, Jr., M. D., Iowa N. G., second vice-president; Senior Surgeon J. C. Perry, U. S. P. H. S., third vice-president, and Colonel James Robb Church, U. S. A. (retired), Washington, D. C., secretary-treasurer.

Cleveland Meeting of American Public Health Association.—The fifty-first annual meeting of the American Public Health Association will be held at Cleveland, Ohio, October 16-19, 1922. Headquarters will be at Hotel Statler. The following sections will conduct programs: Public Health Administration, Laboratory, Vital Statistics, Sanitary Engineering, Industrial Hygiene, Food and Drugs, and Child Hygiene. There will also be special programs on Public Health Publicity and Education and Public Health Nursing. An interesting part of the general sessions of the program will be a summary and conclusions from a survey of eighty-five city health departments, conducted by a committee under the chairmanship of Professor C. E. A. Winslow. A second feature will be a symposium on the subject, "How Can We Safeguard Public Health from Political Interference?" Reduced railroad rates have been granted to members of the association. Further information may be obtained from the secretary of the association, at 370 Seventh avenue, New York city.

Book Reviews

DERMATOLOGY

An Introduction to Dermatology. By Norman Walker, LL.D., M.D., F.R.C.P., Physician for Diseases of the Skin, The Royal Infirmary, Edinburgh. Seventh Edition, with eighty-four Plates, eighty Illustrations in the Text. Published, 1922, by William Wood & Co.. New York.

The author comments on his failure to deal as fully with some of the newer methods in the diagnosis and treatment of skin diseases, in his preface to this seventh edition of this wellknown work. He believes we are on the threshold of a great advance in dermatology, but that it is still too early to accept all the newer teachings without further knowledge and experience.

Readers of earlier editions of Walker's book will recall that this work practically reproduces the course of lectures delivered to the author's students, and therefore is designated an *Introduction to Dermatology,* without professing to be a textbook or a complete system. The author has succeeded in this new edition in bringing it quite up to date, without at the same time enlarging its scope beyond his original intention.

One is impressed by the beautiful black and colored illustrations, which are indeed true to life. The text runs along easily and lucidly, and the style and manner of presentation are suited to the student and the general practitioner, who wishes to have a handy volume on skin diseases within easy reach.

As regards the treatment of syphilis, American dermatologists certainly will take exception to his statement that two or three doses of arsphenamine given at intervals of ten days, in the primary stage, "may sometimes be all the treatment that is required." It is to be feared that such teaching may do a vast amount of harm if it leads students or general practitioners to believe that a few injections of arsphenamine can at any time and under any circumstances be permitted to constitute a full course of treatment in primary syphilis. It may be true that several such injections may cause the disappearance of active lesions, but bitter experience teaches that a cure of the disease requires much more than a few arsphenamine injections.

On the whole the volume is a safe and conservative guide to the most common skin diseases, it is beautifully printed and illustrated, and well adapted to its use as an introduction to the study of dermatology.

SKIN DISEASES.

Diseases of the Skin. By Richard L. Sutton, M.D., Professor of Diseases of the Skin, University of Kansas School of Medicine; Former Chairman of the Dermatological Section of the American Medical Association; Assistant Surgeon, United States Navy, Retired; Dermatologist to the Christian Church Hospital. With Nine Hundred Sixty-one Illustrations and Eleven Colored Plates. Fourth Edition, Revised and Enlarged. St. Louis: C. V. Mosby Company, 1921. Pp. 1132.

Dr. Sutton's admirable treatise on diseases of the skin is already well known through the three earlier editions beginning five years ago, and the fact that the fourth edition is now reached is evidence that it is also favorably known. The author's description of the various diseases is lucid and instructive, but the characteristic of the book is its profuse illustration—indeed if one were to be critical it might be said that it was overillustrated. Thus of lupus vulgaris there are nine pictures, of lupus erythematosus twelve, including a colored plate, of Hutchinson's teeth six, granuloma pyrogeniater eight, varicella five—to take a few instances at random. This of course increases greatly the size of the book, yet there is after all no subject that calls for more liberal illustration than dermatology, since the diagnosis is made largely by the eye and the appearance of the lesion is often so varied that several illustrations are needed to give a complete picture of the disease. From that point of view the book is perhaps not overillustrated. If one wants many pictures one will find them here and will find them admirably reproduced and printed, portraying faithfully the appearance of the lesions in the disease under question.

MICROSCOPY.

The Microtomist's Vade-Mecum. A Handbook of the Methods of Microscopic Anatomy. Eighth Edition. By Arthur Bolles Lee, Hon. F.R.M.S. Edited by J. Brontë Gatenby, B. A., B.Sc., D.Phil. (Oxon.) D.Sc. (Lond.), F.R.M.S., Sometime Lecturer in Histology, Oxford; Lecturer in Cytology and Senior Assistant in Zoology, University College, London, and Senior Demy, Magdalen College, Oxford. With the Collaboration of W. M. Payliss, M.A., D.Sc. (Oxon.), F.R.M.S., Professor of General Physiology in University College, London; G. Da Fano, M.D., F.R.M.S., L.D., on Morbid Anatomy, University of Pavia, Italy; Lecturer in Histology, Kings College, London; A. Drew, D.Sc. (Lond.), F.R.M.S., Imperial Cancer Research Fund, London; W. Cramer, Ph.D., D.Sc., M.R.G.S., L.R.C.P., F.R.M.S., Imperial Cancer Research Fund, London, and J. Thornton Carter, F.R.M.S., F.Z.S., Hon. Research Assistant, University College, London. Philadelphia: P. Blakiston's Son & Co.

This valuable reference book for the research worker needs no introduction. That it has met the needs of the research worker in an admirable way is attested by its having passed rapidly through seven editions. With aid of the collaborators the following chapters have been either thoroughly revised or rewritten and brought up to date: Neurological Techniques, Protozoa, Fatty Substances, Teeth and Bone. The editor has written special chapters or sections on Chromatin, Chromosomes, Nucleoli, Glycogen, Iron, Yolk, Fat, Mitochondria, Golgi Apparatus and Benzidine Dyes; he has completely rewritten the section on Mammalian Embryological Methods. A small but very important addition to the present volume is the inclusion of two new methods for staining bacteria in the tissues, namely, J. A. Murray's chrome-osmic method for mitochondria and bacteria of mammalian tissue and the Drew-Murray van Geison nile blue method for connective tissues and bacteria. A special chapter for students has also been inserted in the work. The volume is not only a comprehensive assemblage of approved laboratory methods, but is well arranged and indexed so that the information it contains is readily available.

NUTRITION.

The Newer Knowledge of Nutrition. The Use of Food for the Preservation of Vitality and Health. By E. V. McCollum, Ph.D., Sc.D. Illustrated. Second Edition, Entirely Rewritten. New York: The MacMillan Company, 1922. Pp. xviii-449.

This is an interesting and instructive book, revised and rewritten in April, 1922, covering essentially all the experimental work of importance on the subject of diet during the last fifteen years. It is not only of value to those doing laboratory work along this particular line but to all physicians interested in diet. It is of interest and value to the laity because diet is so fundamental to health. McCollum has spent fourteen years in animal experiments on diet, at the same time searching the literature for relevant information regarding the dietary customs of various races, and has presented the fruits of this labor.

It is suggested that those who are not interested in the details of the experimental work read first the following chapters: VII, The Vegetarian Diet; VIII, Scurvy; IX, Beriberi; XI, Keratomalacia; XIII, Pellagra; XIV, Rickets; XV, The Nursing Mother as a Factor of Safety in the Nutrition of the Suckling; XVI, New Viewpoints Relating to Practical Problems of Nutrition; XVII, The Dietary Habits of Man in Several Parts of the World; and XVIII, The Most Fundamental Problem in Preventive Dentistry. These chapter headings are sufficiently suggestive to make it unnecessary in this short review to explain their contents. After finishing these chapters the reader will be prepared to read some of the experiments. Those who are following dietetic lines will naturally read them all because they are the best to be found on this subject. Not only information developed by the author but that developed by such men as Chittenden, Osborne, Mendel, and others is presented.

The vitamines are discussed fully. These are becoming so familiar to the public through advertisements that to mention them here is sufficient. The exact causes of these diseases are not proven. However, a good case is made for calcium, phosphorus and some vitamin as responsible in some way for rickets. The cause of pellagra is pretty well fastened upon diet.

The important lesson to carry away after the reading of this book is that there are certain protective foods rich in one or more vitamines. They are milk, the leafy vegetables and fresh fruits and tomatoes—also the glands and organs of animals such as sweetbreads and liver are of value. These, when added to a diet of cereals, tubers and legume seeds, supply what the latter do not contain in sufficient amounts, the vitamines, calcium and minerals. One experiment showed conclusively that cows fed upon the grain of corn and the leaf and stalk grew strong and healthy, produced healthy calves and furnished them with a satisfactory milk. This was not true of cows fed upon the corn grain alone. Animals which are carniverous suck the blood and eat the organs and bones of the animals they kill because they could not subsist upon the muscle tissue alone. A case illustrating the importance of diet is furnished by the American born children of native Japanese parents. The diet upon which the former subsist in California has increased their size and wellbeing over that of their parents whose growth was completed in Japan.

An important conclusion based upon the studies reported in this book is the following: Races less advanced and less civilized have perhaps, on the whole, averaged better specimens physically than the more civilized and better developed mentally. This is not necessary at all. The physical deterioration is due not to lack of exercise and similar causes as much as to refinement in diet. It has so happened that when food has been easy to procure it has been highly refined and man has chosen foods lacking in vitamines and minerals. With sufficient knowledge of the properties of foods and of balance in diet, the best physical development may be regained by the civilized races.

THE ORBIT.

Diagnostic, Traitement et Expertise Des Sequelles Oculo-orbitaires. Par le Dr. F. Terrien, Professeur Agrege a la Faculte de Medecine de Paris, Ophtalmologiste de L'Hôpital Beaujon. Preface par le Pr. A. Gilbert, Professeur de Clinique Medicale a l'Hotel-Dieu de Paris. Membre de L'Academie de Medecine. Avec 67 figures dans le texte. Paris: Librairie J. B. Bailliere et Fils, 1921. Pp. 276.

This compact treatise is published as part of an encyclopedia in eight parts dealing with the oto-rhinolaryngological, ophthalmological, maxillofacial, surgical, orthopedic, nervous, and medical complications of war injuries and industrial accidents. The entire field of wounds, foreign bodies, burns, and contusions of the eye is covered in a practical and instructive, although necessarily sketchy, way. Special attention is paid to the plastic operations on the lids and conjunctival *cul de sac,* to enucleation and substitute operations, and to the diagnostic and therapeutic use of the magnet.

THERAPY.

Taschenbuch der Therapie mit besonderer Berucksichtigung der Therapie an den Berliner, Wiener u. a. deutschen Kliniken; Herausgegeben von Medizinalrat Dr. M. T. Schnirer, Redaktur der *Klinisch-therapeutischen Wochenschrift.* Eighteenth Edition; published 1922, by Verlag Curt Kabitssch, Leipzig.

The eighteenth edition of this useful little pocket volume appears, enlarged and up to date, in the field of practical therapeutics. The editor has crowded within its pages the most recent additions to present-day German therapy. More than two hundred and fifty therapeutic novelties have been added from the literature of German and other sources. It is almost astonishing to see what a vast amount of valuable information for the general practitioner has been crowded between the covers of this little work; much of the credit for this accomplishment should go to the publishers, who have brought this vast amount of reading matter within the confines of a pocket volume without sacrificing the legibility or the quality of paper.

There are some sections in the book which seem curious to the American reader. Under the heading Kosmetik, after discussing the care of the skin, hair and baldness, we come to a brief section on manicuring the nails, and one wonders why that should be necessary in a scientific treatise; it is well to remember, however, that manicuring the nails is a serious procedure in Germany, and requires a full-grown man and a chest of tools for its accomplishment.

There are interesting and useful chapters on sera, poisons, obstetrical data, baths and cures, normal dentition, private sanitaria especially for tuberculosis, diabetic foods, in fact, everything.

VOICE PRODUCTION.

Caruso's Method of Voice Production: The Scientific Culture of the Voice. P. Mario Marafioti, M.D., New York. Preface by Victor Maurel. Published, 1922, by D. Appleton & Company, New York and London.

This most interesting volume of more than three hundred pages, dedicated to and approved by Enrico Caruso, aims at a radical reform in voice culture based on scientific principles, intended to free the voice from artificial influences and insure its natural production. In brief, the work is a plea for natural singing, and an attempt to raise voice culture to the high level enjoyed by the sister arts. The author bemoans the fact that laryngologists have not devoted themselves to the important branch of voice culture, but have left the field to incompetent and often unscrupulous music teachers, who are generally utterly unfamiliar with the physiology of the voice and with the anatomic mechanism of its production.

Marafioti emphasizes the important fact that most throat affections of singers are not pathological in origin. They are usually the result of straining the vocal organs due to incorrect methods of singing. To quote (page 304): "Singing does not affect the throat, but bad singing sets in a chronic congestion of the vocal organs through undue strain and violent effort, just as correct dancing does not harm the legs, while bad dancing may deform or sprain the ankles, or even cripple the performer."

The book is full of valuable information which can well be studied by voice teachers as well as pupils. It is probably the first attempt by a trained laryngologist to apply his knowledge and experience to the scientific training of the voice, both for speaking and singing. No one with any pretense to good singing should be content to go on without having read and thoroughly digested the valuable material contained in this work. The author shows quite plainly how many lives and careers are wrecked by the false hopes which are awakened by ignorant and conscienceless socalled teachers, who play on the credulity of their pupils by instilling in them a belief and a hope of a great career on the concert stage.

If the author's plea for a new class of singing teachers—socalled voice specialists—could be realized, many of these unskilled charlatans would soon disappear from the field, and voice training then would become an art, like painting or sculpture, taught only in reputable schools by reputable and skilled teachers, who would combine a knowledge of the science and the art of voice production.

The author mentions some interesting reminiscences about Caruso, one of which appropriately may be referred to in this review. He affirms, from personal knowledge, that Caruso's bones "had a power of resonance which was startling. In fact, by tapping on his mastoid with a finger, or, as he did himself, with his ear lobe, a sound was produced which could be heard at a considerable distance." The author explains this unusual phenomenon by declaring that the singer's bones "were composed of very fine, compact resounding matter."

Illustrations of Caruso in the act of singing, together with anatomical drawings of the vocal chambers, add interest to this most unusual volume. Both the author and his publishers are to be commended for having brought forth such a useful and readable work. In the words of Caruso, it will "cause a commotion in the field of vocal teaching, and especially among those who are the merchants of teaching," that the practitioner might require at a moment's notice.

MEDICAL PRACTICE.

The Practice of Medicine. By A. A. Stevens, M. D., Professor of Applied Therapeutics in the University of Pennsylvania; Professor of Therapeutics and Clinical Medicine in the Woman's Medical College of Pennsylvania. Philadelphia and London: W. B. Saunders Company, 1922. Pp. 1106.

A conservative yet fully up to date textbook on medicine. Stevens has a broad point of view and refrains from dogmatic assertive postulates. He looks upon medicine as a science capable of growth and change and for this reason alone is in a position to handle well the subject in its branches and in its entirety. His broad background is revealed in the handling of the topics presented and in the most careful selection of references.

TUMORS.

Tumors, Innocent and Malignant. Their Clinical Characters and Appropriate Treatment. By Sir John Bland-Sutton, LL. D., F. R. C. S., Consulting Surgeon to the Middlesex Hospital. Illustrated with Three Hundred and Eighty-three Wood Engravings. Seventh Edition. New York: Paul B. Hoeber, 1922. Pp. x-806.

A comprehensive presentation of the tumors commonly encountered in medical practice. A convenient arrangement and classification have been followed. Wordy controversies have been avoided. In this, the seventh addition, new findings of endocrinological influences and etiological conditions which are related to new growths have been incorporated, as well as twenty new illustrations.

CEREBRAL NOVEL.

Very Woman (Sixtine). A Cerebral Novel. By Remy de Gourmont. Translated from the French by J. L. Barrets. New York: Nicholas L. Brown, 1922. Pp. 317.

The cerebral novel has its excellent qualities. It deals with the quaint chances of actuality. It therefore has to be motivated. It *is* real. Hubert d'Entragues, a successful writer, studies coolly and emotionally the progress of his entanglement with Sixtine. The mental aspect of this not infrequent state of affairs is as uncompromisingly dissected by the victim as by the author. The symbolic quality of d'Entragues's writings during this emotional crisis is of peculiar significance and furnished the subtle commentary on life and love for which we look to De Gourmont as master. The exquisite fragility of the idyll is marred by a few grossnesses probably more striking in the English than in the French, that bring us regretfully down to earth.

PSYCHOLOGICAL STUDIES.

Short Stories. By HONORE DE BALZAC. Boni and Liveright, Inc. Pub. N. Y. Modern Library.

This volume contains a carefully selected group of Balzac's short stories. They make choice reading to fill in odd moments. It seems as though classics of this type should be in more favor than that of the lighter short story so popular today. There is always an unexpected expected in Balzac, that keen student of Latin psychology. Perhaps what his works have lacked in vulgar popularity they have made up in longevity.

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Medicoliterary Notes.

The American Child Hygiene Association, with headquarters at Seventeenth and F Streets, N. W., Washington, D. C., has issued in chart form a statistical report of infant mortality for 1921 in 573 cities of the United States. The chart is "commended to the thoughtful attention of mayors, health officers, editors, citizens, taxpayers, in the interest of the two million five hundred thousand babies born in the United States each year." Among cities with a population of over two hundred and fifty thousand Portland, Ore., has the lowest infant mortality rate, namely forty-eight, and Pittsburgh the highest, ninety-six. Among cities having a population of from ten to twenty-five thousand, East Hartford, Conn., stands lowest with a rate of twenty-four, and Dunsmore, Pa., highest with a rate of 186.

* * *

Peter Whiffle, His Life and Works, by Carl Van Vechten, is an engagingly written and entertaining study in fiction form of a whimsical and very lovable but somewhat psychopathic individual. The scene of the story is laid in Paris and New York, with much local color of both cities, including sketches from the life of well known Greenwich Village personages, and also doubtless of those of Bohemian Paris, recognizable by the initiated.

* * *

A study of the wages and hours of labor in the petroleum industry in 1920 has recently been issued by the United States Department of Labor as *Bulletin 297 of the Bureau of Labor Statistics.*

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Readers who enjoyed that exquisitely written and wholesome tale of the Canadian woods, *Maria Chapdelaine,* by Louis Hémon, will be interested to hear that, according to the New York *Times* of recent issue, the heroine is a real person, by name Maria Bedard, of Peribonka. Hémon spent the winter as a lodger with her family and none of them knew that he was writing about them until after he had left and three copies of the book came.

* * *

The New York Nutrition Council has recently prepared for publication and distribution two useful pamphlets which should be particularly valuable to physicians, nurses, social workers, and dietitians. The respective titles are *Good Nutrition and Adequate Food Allowances for the Family,* and *Height and Weight Index of Nutrition.* Both pamphlets have been issued by the New York Association for Improving the Condition of the Poor.

* * *

The *Atlantic Monthly* for September might be called a psychological number. Katherine Fullerton Gerould has an article on Men, Women and the Byron Complex; The Letter Law and the Golden Rule is the title of an interesting study of the overcomplex legal procedure of today and its inevitable failure to protect from the dangers of mob spirit; The Jungle of the Mind, Notes on a Disfranchisement, a personal narrative of recovery from a nervous breakdown; Gone Away, by Emma Lawrence, a fictional description of deathbed psychology; The Strange Mind of India, by J. A. Chapman, a study of three types of the Oriental temperament, as seen in a priest, a schoolboy, and a clerk; and Europe in the Melting Pot, with Some Notes on French Statesmen, by Sisley Huddleston. The Contributors' Column contains two letters, interesting from a controversial point of view, from a chiropractor and osteopath respectively, in reply to an article in the July *Atlantic* by Dr. Channing Frothingham on Osteopathy, Chiropractic and the Profession of Medicine.

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The *Journal of Tropical Medicine and Hygiene* (London) has made its issue for June 15th a special Manson Number, in commemoration of Sir Patrick Manson, the great pioneer of tropical medicine. Special features are a brief autobiography of Manson, with an introduction by Dr. W. L. Sambon, and a bibliography of his writings.

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The Health Builder is the title of a new magazine to be published by Doubleday, Page & Co. The first issue will appear in October.

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The Life of Clara E. Barton, founder of the American Red Cross, by William E. Barton, has recently been issued in two volumes by Houghton Mifflin Company. The book is not only a biography of Miss Barton, but also a history of the American Red Cross. It is based upon all the material left by Clara Barton at the time of her death to her literary executors. This consisted of private papers, personal letters, records of the Red Cross, scrapbooks, articles in journals, and clippings from many sources. One of the interesting facts brought out in the biography is the long and trying struggle endured by Miss Barton in her endeavors to secure recognition in this country of the International Red Cross, a struggle throughout which she showed a continuous spirit of patience yet determination in opposition to the apathy and hostility of the Senate, a spirit through which her cause finally won.

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New Publications Received.

PASTEUR AND HIS WORK. By L. DESCOUR. New York: Frederick A. Stokes Company, 1922. Pp. 256.

EPILEPSY, HYSTERIA, AND NEURASTHENIA. By ISAAC G. BRIGGS. London: Methuen & Co., Ltd., 1922. Pp. xi-149.

DISEASES OF THE SKIN. By HENRY H. HAZEN. Second Edition. St. Louis: C. V. Mosby Company, 1922. Pp. 608.

Practical Therapeutics

THE HOT AIR MINERAL OIL TREATMENT OF EXTENSIVE BURNS.*

By W. A. Steel, M. D.,
Philadelphia.

From earliest times vegetable oils and animal fats have been employed locally in the treatment of extensive burns. When used as occlusive dressings, they tend to decompose and encourage suppuration, and in recent years surgical opinion has been strongly opposed to their employment. As olive oil was discarded, antiseptics were tried; but it was found that chemicals applied over a long period of time to a burned surface produced hard contracting scars.

Then came the continuous hot water bath which gave excellent results; but the specially devised tanks necessary for its employment excluded it as a routine procedure.

The recent introduction of paraffin preparations which do not decompose and which are employed clinically, as amberine, paraffin wax and mineral oil will probably supersede other dressings. The advantages of the paraffin preparations are that they limit pus formation and cause no local irritation.

The only advances made in the local treatment of burns for perhaps a century have been the continuous hot water bath and the paraffin preparations. We have endeavored to combine these advances and simplify them by substituting hot air for the hot water and mineral oil for the paraffin wax. The following technic which we have used routinely for the past eight years has given encouraging results:

TREATMENT OF THE STAGE OF SHOCK.

The patient receives liberal hyperdermic doses of morphine. After pain is relieved, remove the burned clothing, first soaking it well with normal salt solution. If tar or molten metal are adherent to the tissues, do not remove them.

Spray the whole burned area with mineral oil without applying any other dressing. Place a gauze pad under the body, below the burned area. Place over the whole body from the neck to beyond the feet a metal frame covered by a sheet. Hang one or two electric light bulbs from the roof of the frame of sufficient power to keep the temperature at 105° F. (Fig. 1). The patient is kept in the hot air bath during the whole course of treatment, and disturbed as little as possible.

TREATMENT OF THE STAGE OF AUTOINTOXICATION.

Excessive toxemia may require saline by Murphy drip or hypodermically to aid elimination. Saline is not used routinely, and is rarely necessary. Locally the burned areas are sprayed three times daily with mineral oil. The gauze pad under the back, below the burned area is changed once daily. The patient adjusts himself under the cradle in any comfortable position.

TREATMENT OF THE STAGE OF SUPPURATION.

But little pus appears, with this plan of treatment. The burned skin and any adherent material, separate in about one week, and fall off or are picked off without pain. The exuded serum from the raw surface forms lumpy, irregular soft crusts with the oil, which separate spontaneously or are picked off every second day. These soft crumbling crusts give the wound an ugly look, but should not cause any anxiety.

TREATMENT OF THE STAGE OF REPAIR.

The newly formed skin has not the dark red, keloid character often seen after repair of suppurating surface. The scar is comparatively soft and flexible.

The scar tissue is much less than by many other methods and does not have the tendency to contract; so that disfigurement and loss of function are largely eliminated.

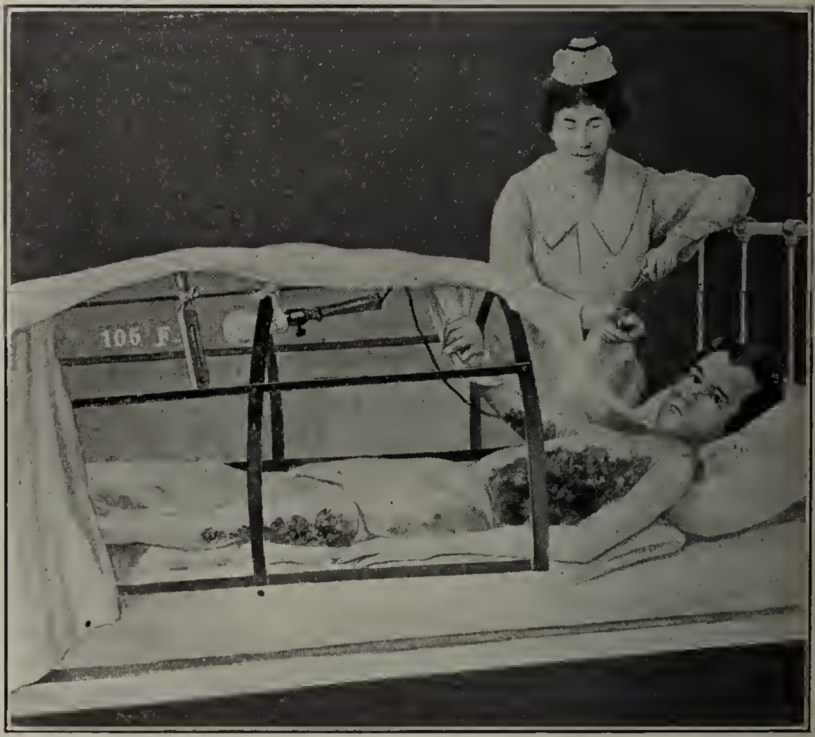

Fig. 1.—Apparatus for treatment of burns.

A prophylactic dose of tetanus antitoxin is given routinely on admission. Appropriate eliminative measures are carried out and the diet regulated according to the systematic condition.

Face burns receive the same general treatment with the exception of the hot air bath. No occlusive dressing is used.

This plan of treatment meets the requirements of the extensive second degree burn usually encountered in civil and industrial practice. Deep charring of tissue or burns of special regions must be treated by applying the recognized principles of surgery to the special condition. Overwhelming shock or autointoxication is met by appropriate measures, of which transfusion of blood and alkaline solution gives the best results. Joint contractures and facial distortions must be corrected by those plastic methods, which the abundant experience at the late war has systematized and perfected.

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*Read before the Philadelphia Association of Industrial Medicine, April 8, 1921.

The advantages of this plan of treatment are:

1. Its simplicity for no special or expensive apparatus is necessary.
2. The patient is subjected to the minimum amount of disturbance and handling.
3. The dressing is applied by the nurse and takes but from one to two minutes three times daily.
4. Relief from pain is marked; suppuration is greatly diminished; and stench is abolished.
5. The wound heals with the minimum amount of scar tissue and disfigurement.
6. It is a cheap, simple, efficient, labor saving plan, giving as good results as the much exploited closed paraffin methods.

3300 North Broad Street.

Some Uses of Static Electricity.—Rolf Creasy, Jr. (*Medical Press,* May 3, 1922) asserts that static electricity will often cure certain conditions when faradic and galvanic currents fail. He finds it useful, 1, for the removal of lymph and exudation; 2, to relieve pain; 3, to increase the blood supply to a part; 4, to revive paralyzed or paretic muscle and to increase its size; 5, to heal lesions by its antiseptic action, and 6, to raise or lower the blood pressure according to the modalities used. It also has both tonic and sedative effects in neurasthenia and overexhaustion. It is indicated in, 1, muscular rheumatism (fibrositis, myositis, neuritis, etc.); 2, joint affections such as rheumatoid and osteoarthritis, posttraumatic recurrent pain and swelling, acute traumatic synovitis, acute gout; 3, adherent scars; 4, paresis or paralysis of groups of muscles; 5, dyspepsia and constipation; 6, enlarged prostate, gonorrheal prostatitis, vesiculitis and epididymitis; 7, ovarian pelvic and lumbar pains, and 8, acne and chilblains.

Diathermy in the Treatment of Malignant Disease.—F. J. Steward (*Practitioner,* May, 1922) says that in order to treat a case of malignant disease satisfactorily by diathermy, two conditions are essential, apart from the provision of an efficient apparatus. These two essentials are good illumination and complete exposure. If, for instance, the growth is situated within the mouth, a good headlight is necessary, and by means of gags, retractors, sutures through the tongue, and if necessary splitting the cheek, the whole of the affected area must be brought into plain view, for no good can be expected to result from working in the dark.

The above conditions being present, the steps of the operation are as follows: With a flat, knifelike electrode, a line is traced in the healthy tissues around the margins of the growth, keeping the electrode a full half inch away from the edge of the infiltrated area. As the tissue with which the electrode is brought into contact immediately becomes coagulated and turns white, an easily recognized edge to the area to be treated is thus formed. The whole of the area so marked out is now systematically gone over with a blunt ended electrode, which must be firmly pressed into the tissues and not moved to a fresh spot until liquefaction and boiling takes place around it. The growth itself under this treatment in part liquefies, and in part becomes friable, so that it can be gently scraped away or rubbed away with a sponge from time to time until its limits in depth are reached.

In order to ensure the destruction of sufficient tissue on the deep aspect of the growth, the floor of the cavity thus produced is now treated by plunging a needle electrode deeply into the tissues, keeping it in position until boiling takes place around it and then moving it half an inch away, until the whole area has been treated. Should bleeding occur the blunt electrode should be pressed firmly on the bleeding part and the strength of the current increased slowly so as to induce coagulation. A large vessel may need to be ligatured. The main indication in after treatment is to keep the parts clean as far as possible during the separation of the sloughs. Secondary hemorrhage rarely occurs.

Anesthesia.—G. L. Labat (*Annals of Surgery,* December, 1921) states that regional anesthesia, in which should be included spinal anesthesia, has developed into a science and should be treated as such. To be successful the anesthetist should have a perfect knowledge of anatomy and surgical technic, and should be familiar with the chemistry, pharmacology, and the physiological effects of the drugs he administers. He should know how to handle the patient before and during the operation and, above all, have mastered the general principles of the methods.

The surgeon who operates under regional anesthesia should be familiar with the general principles of the method so as to be able to complete the anesthesia during the operation. He should not have recourse to general anesthesia when one or two injections, judiciously made, would render the operation painless. Such knowledge would also give him a correct idea of the extent of the anesthetic field and in a general way help him to understand the aftereffects, if any, and the treatment thereof.

The beginner should not be expected to be successful with his first attempts; partial failures can be remedied by inhalation narcotics. He should not abandon the method as being worthless or insufficient. He should remember that even experts may fail and should try it again, observing scrupulously its principles until he succeeds. There is no reason why he should not succeed when in the hands of others the results have been so satisfactory. But he can readily understand from the foregoing how necessary it is to have an exact knowledge of the technic and attending circumstances of spinal anesthesia if he wishes successfully to employ such a delicate procedure.

Novocaine is the anesthetic drug of choice in both regional and spinal anesthetic procedures. It should be pure, and when injected intraspinally, pure and sterile and dissolved in the cerebrospinal fluid of the patient. The dose of 0.01 gm. of novocaine for each fifteen pounds of the body weight of the patient, injected very slowly, is safe for any operation below the diaphragm. The author suggests that every young medical student should devote part of his time to studying this method so as to be able to apply it later on in his own private practice. And since a knowledge of general surgery is required, he who is anxious to make it a specialty should have a postgraduate course in that subject.

Proceedings of Societies

SYMPOSIUM ON CANCER OF THE SKIN.*

Held at a stated meeting of the New York Academy of Medicine, April 21, 1921.

Vice president Academy of Medicine, Dr. Rufus L. Cole, in the chair.

Clinical and Histological Features of Cancer of the Lip and Tongue.—Dr. J. A. Fordyce showed a number of lantern slides illustrating these conditions preceded by a brief reference to the statistics of Broders as to the sites of predilection of the prickle celled type cells. He also quoted Fricke's study of 1,338 cases of lip cancer which showed that men were affected in more than ninety-one per cent. of the cases and women in about nine per cent. In addition to the demonstration of a number of cases of precancerous keratoses and welldeveloped forms of lip cancer, he showed four cases of prickle celled epithelioma of the lower lip in women and two cases of basal celled epithelioma of the upper lip. In none of these cases was it possible to invoke the usual causes to prolonged local irritation. He called attention to the possibility of mistakes in diagnosis between cancer of the lip, the initial lesion of syphilis and the late syphilitic neoplasm. A number of histological slides were shown illustrating the early changes in the epithelial structures of the lip; the differentiated types with welldeveloped horny pearls and the undifferentiated forms. He illustrated by contrast the origin and structure of basal celled epithelioma of the skin and mucous membranes. Finally a series of lantern slides were presented showing the clinical and histological features of leucoplakia, interstitial glossitis and carcinoma of the tongue, together with slides of lichen planus, lupus erythematosus and tuberculosis of the tongue and mucous membrane of the mouth. The clinical features of tongue cancer were usually so definite that mistakes in diagnosis should not occur if the possibility of the association of cancer and syphilis be kept in mind. In cases of doubtful diagnosis the therapeutic test should be employed. He referred to a number of instances in which cancer of the tongue had developed at the site of a syphilitic lesion and in which the presence of a positive Wassermann reaction had led to a mistaken diagnosis and delay in treatment.

Treatment of Skin Cancer.—Burton J. Lee, in discussing the treatment of cancer of the skin from the viewpoint of the surgeon, said that in view of the rapid advance which has been made in recent years in the treatment of malignant new growths by means of radioactive substances, no surgeon can approach a discussion of the treatment of epitheliomata of the skin without due consideration being given to the results obtained by these nonoperative means. He therefore considered it the duty of the surgeon honestly to investigate the results of the treatment of cancer of the skin by radium and x ray with a thoroughly open mind.

He stated that it had been his privilege for the past few years in the clinic at the Memorial Hospital to see numerous cases of cancer of the skin, some of which had previously been operated upon, while others had been treated partially or completely by the use of radium. He felt that this experience had compelled an attitude of fairness in comparing results of treatment of these lesions by surgery or nonoperative methods or a combination of both.

An accurate pathological diagnosis of any lesion should be made, if possible, in order that results published may bear the approval of the best scientific scrutiny. The removal of a section for diagnosis was, in the opinion of the writer, not attended with any serious consequences, and he believed it to be a thoroughly justifiable procedure. One exception, however, should be made in the case of a very small lesion where excision of the growth was as simple as removal of a small section from it.

Occasionally the surgeon may be fairly open to criticism because of a somewhat narrow attitude toward any other therapy than surgery. Upon the other hand, the radium or x ray worker too often exhibited an overenthusiasm and undue optimism of the results to be obtained by radium or x ray and a rather too early announcement of a socalled cure in any given case. Workers in the cancer field should therefore observe the greatest caution in the statement of their results; the term "cured" should not be employed until five or better ten years have passed since the date of the last treatment. The term "satisfactory result to date" is all that should be used by either surgeon or radiotherapist until many years have elapsed.

Concerning his experience with melanomata, Dr. Lee said that in the past six years fifty cases of melanomata had applied for treatment at the Memorial Hospital. They represented one of the most hopeless groups coming to the institution. Many of them had had previous operations performed upon pigmented moles, with a line of excision much too close to the mole and subsequent rapid development of melanoma. Others had suffered recurrences following radical operation upon melanomata of the skin. A certain proportion had been primary cases upon which no operation had been attempted. He had yet to see a case of melanoma treated successfully by surgery and had never yet witnessed a favorable result following treatment by radium or any radioactive substance. The whole field here in the presence of a fully developed disease seemed at present thoroughly hopeless.

Squamous celled epitheliomata of the lip is generally regarded at first as a local disease. Even if there is some invasion of the deeper tissues of the lip, the process is still local and remains so for some time before the lymph nodes become involved. Inasmuch as it is apparently an embolic involvement of the nodes rather than an extension by permeation, the treatment of epitheliomata of the lip may be considered under two categories: first, the treatment of the primary lesion; and second, the treatment of the invaded lymph nodes.

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*Program in cooperation with Section of Dermatology and Syphilis.

In considering the removal of an epithelioma of the lip, Dr. Lee said that he was fully aware of the fact that the majority of surgeons advised and practised radical excision, with a dissection of the nodes at one or both sides of the neck. Such an operation, properly performed, gave almost an absolute guarantee against recurrence in the lip itself, but was almost always attended by a certain amount of tightening deformity. On the other hand, if the original tumor of the lip was treated by radium, or even by unfiltered x ray, it was very successfully and permanently removed with a minimum of deformity following—in fact, practically no deformity of the lip itself remained, and an equal guarantee against recurrence in the lip itself could be assured.

When the treatment with respect to the lymph nodes was considered, he felt that we had here still a surgical problem to deal with, whatever the procedure for the original tumor. The practice at the Memorial Hospital in the treatment of epithelioma of the lip without palpable involvement of the lymph nodes had consisted in treating the initial lesion of the lip by radium and the nodes of the neck by a radium pack or x ray. If subsequent involvement of the lymph nodes occurred, a neck dissection was practised and bare radium tubes were inserted at the point of section of the lymphatics. If a case presented itself with involved nodes, the pack was applied, the nodes were dissected, and the radium was implanted as previously described.

Dr. Lee firmly believed, however, that removal of the lip tumor itself should be made by radium or unfiltered x ray, and that any surgery done upon the nodes of the neck should be supplemented, before and after operation, by the use of radium.

With reference to the basal celled epithelioma, or the socalled rodent ulcer, this was a condition which metastasized slowly and remained a local disease for an exceedingly long time. Here one had a choice of wide excision by surgery or treatment by radium. He had seen good results following the use of both methods, but where surgery had been employed a disfiguring scar often followed and the end result was no better, if as good, as that obtained by the use of radium. Where radium had been used intelligently the results were exceedingly gratifying, and he believed that this type of growth was one of the most favorable for treatment by radium. He was therefore convinced that in the field of rodent ulcer surgery had better be abandoned.

In conclusion, Dr. Lee desired to make an earnest plea to the surgical profession to investigate with an open mind the results of the treatment of these lesions by radiation, that a fair comparison might be made with the results obtained by surgery.

Douglas A. Quick emphasized the point made by Dr. Lee in regard to the importance of accurate diagnosis and the time of reporting a cure, and said that many cases of different types were shown photographically as being cleared up, but that meant relatively little unless the exact diagnosis was known.

In dealing with the socalled basal cell carcinomas of the skin, one might well take considerable latitude as to the methods to be employed. In his opinion, as between radium and surgery, radium offered the better result in that the scar was less unsightly, the procedure was a smaller one to the patient, and the results were more uniformly good. Most of these lesions were amenable to radium; on the other hand, a great number of them were inoperable. The only cases of this class in which he would be inclined to use surgery were those in which it would give a better exposure to the radium. As Dr. Pfahler said, in both those that had been neglected and where they had been tampered with, and where recurrences had taken place in infoldings of the tissue following plastic surgery, surgery might well be employed to clear the whole thing out as far as possible, and the patients be treated with radium afterward. Many of the basal cell carcinomas might well be treated with the electric cautery because of its simplicity.

In dealing with the squamous cell carcinoma of the lip within the oral cavity, a more serious problem was confronted that must not by any means be compared with basal cell carcinomas. One might see excellent results, as shown by Dr. Pfahler, and still he would not be willing to treat them on the whole with electrocoagulation. He did not favor the use of heat because it was a devitalizing process which opened up avenues of dissemination for the disease. Then, with these lip lesions, this effect should be considered. It was an excellent method within a limited field, a method which was bloodless and could in many instances be used where a first class surgeon would hesitate to go in with a knife. That appealed to many people, but one should not for that reason push it beyond bounds. The lip offered an excellent location for the use of radium and was a favorable field for its employment. Some of the lesions—and some very extensive ones—spreading along the lip were by no means the worst; the deepseated ones were the worst. Dr. Quick said he was very glad to note that in one or two of these cases Dr. Pfahler had buried radium deep in the growth. That was the only way to handle some of them, especially some of the recurrent cases. There was much less disfigurement from radium there than from surgery.

After all, the chief problem was in dealing with the cervical nodes. Most men were agreed that they extend not by permeation but by embolism; and the plan at the Memorial Hospital had been to radiate the neck externally and leave it at that, unless operable nodes were palpable, in which event a surgical dissection was done, burying radium in the wound, and following it by further external radiation. At first they had not been so much in favor of external radiation as now.

Dr. Quick said he had never seen epidermoid carcinoma of the neck showing complete disappearance under the external application of radium; it had been secured by burying radium emanation in the nodes, but never by applying it externally only.

With lesions about the eyelid and in some of the delicate locations where accurate approximation was necessary, radium was preferable to x rays or surgery. Two points should be emphasized: in using radium on these lesions it must be accurately applied—one could not put a piece of radium in the neighborhood of a growth and expect it to disappear; and a sufficient dose must be employed. Lesions were frequently seen which were said to have had radium used on them; that might be very true, but it had been used in such dosage as to mean very little. Accuracy and intimacy of approximation were very important.

Dr. Quick expressed the hope that Dr. Fordyce would say something more about leucoplakia. He had been very much interested in the slides showing the pearls deep in the tissues, with the leucoplakia on the surface. He had sometimes thought in those cases that the disease was arising from multiple points of origin rather than from a single focus. He also hoped that some of the other gentlemen would express their opinion as to what should be done with the melanomas. This had proved to be a most discouraging field at the Memorial Hospital. Personally he was inclined to let alone any pigmented mole that was stationary. If increasing in size, it should be radiated as heavily as possible. That treatment seemed to offer the best hope of relieving the patient from distressing symptoms for the longest period of time.

Dr. POLLITZER said that from the interesting and instructive exhibition of photographs it seemed inevitable that an impression would be gained that epithelioma of the skin was a grave disease. As a matter of fact, epithelioma affecting the skin itself was only rarely a fatal disease, and was a serious menace to important structures—like the eye—only in cases of extreme neglect or indifference on the part of the patient. Fully eighty per cent. of instances of cutaneous epitheliomata were of the basal cell type, which never metastasized. Another point brought out by the pictures, especially those shown by Dr. Pfahler, was that many of the cases had been far advanced when they came to a competent surgeon. It was this feature—the general neglect on the part of the public of lesions which were regarded as harmless because they were not painful—that it seemed to him the most urgent business of physicians to combat. Another element that led to fatal delay on the part of the public was the belief that cancer was necessarily a fatal disease. Dr. Pollitzer said that cancers of organs other than the skin rarely occurred in his practice, but he could recall at least half a dozen inoperable cases with extensive infiltration or even ulceration of the breast that had been going on for several years, which had never before been seen by a physician, and when he inquired why the patient had waited so long, the pathetic reply had been: "I was afraid it might be a cancer?" The public must be taught that cancer properly treated at its inception was almost invariably curable. Education of the public to the importance of early treatment offered today the most hopeful field of activity in the fight against cancer. There was an impression, said Dr. Pollitzer, that leucoplakia commonly lead to cancer of the mucosæ. One surgeon reported an antecedent leucoplakia in thirty per cent. of his cases of cancer of the tongue. These figures conveyed a false impression. The dermatologist sees hundreds of cases of leucoplakia and relatively few cases of cancer. It was practically only the extensive or severe leucoplakias that occurred in connection with deep syphilitic lesions of the tongue that were a serious menace. As to the term "precancerous" for these and certain other conditions, Dr. Pollitzer said he recognized the justice of Dr. Highman's strictures; but though this term was indefensible both in pathology and logic he hoped, nevertheless, it would continue to be used because it served to call attention to the fact that the lesions in question often did become cancerous, and therefore put the physician on his guard. The worst of these occasionally precancerous lesions were the pigmented moles or melanomata. The management of these moles differed very much with different physicians. Many left them alone until there were manifest signs of proliferation—that is, until they were no longer precancerous. These melanomata were the most malignant of all cancers and their proliferation usually implied a death certificate. Dr. Pollitzer said that it was his practice to advise the radical removal of every pigmented mole before it showed any signs of change, if it be located where it was or might be subjected to irritation—on the nose, where it was likely to be irritated by the spectacles or *pince nez;* on the face, where the razor repeatedly traumatized it; and especially on the foot where it was subjected to unavoidable injury from the shoe. It was a matter of experience that pigmented moles of the foot frequently lead to general melanomatosis. In these cases the location of the mole was an indication for operation, and the operation must be done as carefully and as radically as if the mole were already cancerous. Some surgeons preferred the actual cautery to the knife. Where the knife was used an important fact brought out experimentally by Wood in mouse cancer should be remembered—namely, that massage of a superficial cancer readily produces a dissemination of the disease. The surgeon should not only excise widely but should be careful not to touch or squeeze the melanoma itself with fingers or forceps and to remove it without massage or handling.

The lesson to be carried away from this meeting was the importance of the early recognition of possibly malignant lesions and their prompt and energetic treatment. Waiting might be fatal.

Dr. TRIMBLE said that in the main he was in agreement with practically everything that had been said by the readers of the papers. He thought cases of skin cancer, especially those appearing on the face, should be regarded individually and the selection of the method of treatment was a matter of judgment, especially as regards the depth of the growth, the cosmetic results, etc. Some cases seemed to demand either x ray or radium—more particularly the lesions situated at the inner canthus of the eye or on the eyelid and those that appeared in the external auditory canal or in any place that was inaccessible to the knife, while others were more suitable for surgery.

At the Bellevue Clinic they had cured—though perhaps healed would be the better word—a number of cases with the x rays, and he could also show quite a number of spectacular results produced by radium. Even with this evidence of the efficacy of these methods, his leaning was to surgery if the operation could be done without any great distortion of the parts. Surgical methods were applied in two ways, excision and curettage followed by cauterization. There was no objection to the former, though to his mind the latter offered the best cosmetic result if the growth was not too large. The usual claim of the surgeon was that excision was the best method for the reason that the incision was made through healthy tissue and the cancer cells were not disturbed during the operation, while the curettage method breaks down the growth, macerating the cancer cells into the mouths of the bloodvessels. The claim of the dermatologists was that the growth was not only removed but the cancer cells were destroyed by the caustic and that in all probability the caustic penetrated to a certain degree, thereby reaching some of the cells that had already traveled a short distance from the surface growth. These remarks of his did not refer to cancer of the vermilion border of the lip nor to the socalled melanoma. Heretofore he had considered cancer of the lip as belonging absolutely to the surgeon, and he was glad to hear from one of the speakers that radium had produced such splendid results. He had himself used all the methods of treatment spoken of except electrocoagulation, and Dr. Pfahler was to be complimented on the excellent work he was doing.

In conclusion, he said that the fundamental idea was to destroy the growth and that any method that would accomplish that was the proper one, taking into consideration the welfare of the patient as to resulting deformity and cosmetic results.

Dr. Isaac Levin said he had been asked to confine his remarks to carcinoma of the lip and tongue. He agreed with the dermatologists that, speaking from the viewpoint of embryology, it might be correct to consider carcinoma of the oral mucosa as their domain. However, the same would be true as regards carcinoma of the vagina, the cervix, the larynx, the esophagus, or other regions. Moreover, it was feasible to conceive that from the viewpoint of the efficiency of cancer therapy it would be better for all cancer patients to be taken care of by a general medical man before they were referred to a surgeon. The enthusiasm of surgeons for the operative treatment of carcinoma was justified by the wonderful progress surgery had made in the treatment of carcinoma in the last three decades. Nevertheless, it was imperative that surgeons change their orientation to a certain extent and consider radium and x ray therapy alongside of the surgical methods. Time did not permit to consider as an instance in point the surgical removal of the original lymph glands in carcinoma of the lip and tongue. Each lymph gland must be considered anatomically as an organic unit with the afferent and efferent lymph vessel—which, in the case at issue, would mean the lymph vessel which leads from the primary carcinoma to the lymph gland of the neck, and the efferent vessel the one that leads from this lymph gland to more distant tissues. In the course of operative removal of the lymph gland, both lymph vessels must of necessity be opened, and since the probability is great that the vessels both contain a certain number of freely floating cancer cells, a dissemination and subsequent local recurrence, as well as the formation of distant metastasis must result.

Dr. Levin further stated that in his opinion the insertion of socalled buried radium emanation needles into the infected lymph gland was superior to surgical removal, inasmuch as it does not necessitate the opening of the lymph channels and—as he had frequent occasion recently to satisfy himself—destroyed completely the cancerous tissue within the lymph gland *in situ*. Moreover, such a preliminary treatment of the lymph gland would not make the subsequent removal of the gland—if such were found necessary—any more difficult technically. Dr. Levin stated that he was of the opinion that in the near future such methods of treating localized carcinoma without, or as a preliminary to, surgical removal, would be found to be the method of choice in various other conditions, as, for instance, carcinoma of the breast, the cervix, and other regions. He himself had given up the electrocoagulation method since the development of this method of inserting buried radium emanation needles.

Dr. Williams said that the term precancerous might or might not be good etymologically, but that was not the point. Epitheliomas did sometimes arise from a skin previously normal, but rarely. They usually occurred on a diseased skin, and more especially on a certain type of skin. Some word was needed to describe the condition, and as precancerous was the only word available it had better be used. Impaired nourishment was one of the causes of cancer, and usually some scar tissue. The x rays produced cancer by causing atrophy and scar tissue; lupus erythematosus and lupus vulgaris produced it, usually by prolonged irritation and by production of scar tissue; also senile keratoma upon an atrophic skin, thin and poorly nourished, and with some scarring. The atrophy or scar tissue seemed to be the primary thing—all of which led to the need of proper treatment to prevent the development of these precancerous conditions—the early treatment of syphilis so that scar tissue should not form; the treatment of lupus erythematosus and lupus vulgaris so that they would not go on to the formation of scar tissue. Senile keratoma was probably one of the foremost precursors of cancer; it was particularly likely to occur on skin exposed to the actinic rays of the sun, as in the case of sailors and farmers; therefore measures should be taken to protect the skin from undue exposure, and at the first sign of the development of a senile keratoma with pigmentation some bland ointment or other measures should be employed to prevent it from going on to epithelioma. He had seen cases where proliferation had gone on to a considerable extent that had been entirely checked. In one instance a woman of seventy had a very suggestive lesion which had cleared up rapidly over a year ago under a simple salicylic ointment, and today one could not tell where the spot had been. Dr. Williams said he did not wish any one to think that he would treat epithelioma with salicylic acid. The case he had referred to was a senile keratoma before becoming cancerous. By preventing continued irritation the danger of cancer can be prevented or reduced to a minimum.

Dr. Fordyce had spoken of the danger of making a biopsy in these cases. Every surgeon and every dermatologist would agree to that. If the lesion was cancer, it should be treated and treated hard. Dr. Pfahler had asked Dr. Fordyce how long he would continue antisyphilitic treatment for the purpose of determining whether a suspicious case was syphilis or carcinoma. That was a point that led to the necessity of clinical experience and accurate observation, and of not placing too much reliance on the laboratory reports. Because a man had a four plus Wassermann one was not justified in continuing to treat such a case as a gumma. As a matter of fact, many physicians seemed to think that so long as a patient gave a four plus Wassermann everything that patient had was due to syphilis, which was not true.

Referring to what Dr. Pfahler had said about giving two or three skin units at the start, Dr. Williams seconded and emphasized that statement. If one was going to treat epithelioma, he should hit it hard and not stop at any half measures.

Dr. HIGHMAN said he did not see why in order to exert care in medicine one had to use absurd terms. Every one knew that there was a series of conditions that sometimes led to cancer, but more often they did not. Probably if full statistics were available concerning conditions that terminated fatally their ratio to those that did not would be found to be comparatively small. Dr. Williams had elaborated the importance of treating cancer before it developed. Suppose a man had fifteen pigmented moles and three or four senile keratoses, and had a senile skin, what was to be done? The simple thing to do with a senile skin would be to flay its possessor, which would be absurd. How was it possible to treat this wide range of precancerous conditions? The proper thing was to remain wholesome and not become hypochondriacal. Why not let sleeping dogs lie? Probably the type of senile keratosis referred to by Dr. Williams as cured by a bland ointment would never have become a skin cancer anyway. The type that would become malignant would demand more treatment than simple vaseline or salicylic ointment. Furthermore, probably all cancers arise on healthy skin but have an intermediary stage clinically unrecognizable as cancer, unless the idea of Cohnheim was correct that they were due to congenital anomalies.

Dr. HIGHMAN said he would like to know whether Dr. Williams or any one else had investigated the incidence of cancer that began on normal skin. Statistics based on statements of patients were not always reliable. To them all cancers of the skin started as socalled pimples or scales, and why not, for how should they make diagnoses? In fact, they were cancer from the outset, and it did not follow at all that other lesions resembling the scaly stage of epithelioma, i. e., precancerous lesions were actively so. Only their development could disclose that fact.

Dr. FORDYCE said that Dr. Williams had replied to several of the questions asked by Dr. Pfahler. In his experience he had found that malignant change in the tongue following leucoplakia was frequently mistaken for syphilis. The antisyphilitic treatment was often persisted in too long because of an existing Wassermann reaction. If localized tumor formation or induration in association with leucoplakia did not yield promptly to salvarsan and mercury, the chances were that the condition was malignant and not syphilitic. Syphilitic diseases of the tongue, including leucoplakia and interstitial glossitis yielded slowly to salvarsan and mercury. As a rule the interstitial glossitis yielded first. The surface changes in the tongue improved up to a certain point and then remained stationary. When this condition was reached other procedures must be employed to control the leucoplakia in addition to our antispecific drugs.

Dr. PFAHLER said the real point he had wished to bring out was that when a patient had had syphilis or gave a history of syphilis or had a positive Wassermann, and had a lesion on the tongue which Dr. Fordyce would probably recognize from the beginning, the general practitióner would allow the condition to go on for six months or a year, and then state that it might become cancer, when it was already cancer. What he had wanted to do was to discourage the idea of treating such a condition as syphilis for months without getting the opinion of some one who knew something about it.

Dr. FORDYCE replied that if a localized tumor of the tongue did not yield readily to salvarsan or mercury, the chances were that it was malignant and that it required surgical interference. The skilled diagnostician, however, easily recognizes malignant disease of the tongue from its objective appearance.

Dr. PFAHLER, in closing, said he would be very brief and perhaps a little dogmatic. It was his belief that all precancerous conditions—it made no difference whether one called them that or not—should receive careful attention, but that sometimes it was advisable to wait for definite indications before treating them. He then cited the case of a woman aged eighty-four who had consulted him with perhaps some two hundred keratoses the size of a nickle, and he advised her to leave them alone unless they started a disturbance. Had a woman of forty or fifty presented such lesions he would have advised their removal. With regard to melanomas, however, he would not himself leave a pigmented mole on his own body a day longer than he could help, but would destroy it with electrocoagulation and then apply two erythema doses of x rays. He had in no instance failed with such treatment; whereas when patients had had such lesions excised metastases had always developed that could not be checked. If primary lesions were treated by electrocoagulation and then by radiation they would get well, and he would not leave one on the body a day longer than was necessary. Electrocoagulation did not open up bloodvessels as suggested by Dr. Quick, but sealed them, and this was one of the great advantages of the method over cutting. This could be proved by cutting a small artery or vein and then closing it off by electrocoagulation, as he had often done. Another advantage was the zone of heat beyond the actual area of destruction, in which cancer cells would be destroyed.

Abstracts from Current Literature

NEUROLOGY

Puncture of Gasserian Ganglion.—C. M. Van Allen (*Annals of Surgery,* November, 1921), in a study of transorbital puncture of the gasserian ganglion, concludes that whatever injury is inflicted upon the root of the ganglion by the injection of alcohol will be shared to a less extent by neighboring nerves. This is true, no matter by what approach or technic the needle is entered, and transorbital puncture is no exception. Accordingly, until some means shall have been discovered of preventing this widespread diffusion of the alcohol, the puncture cannot be recommended in the treatment of trigeminal neuralgia. Other possibilities for the employment of the technic suggest themselves. It affords a method of withdrawing cerebrospinal fluid directly from the basilar cistern. Wider experience may justify an attempt to use this route for therapeutic applications to the central nervous system. The effect of air injections in the x ray diagnosis of intracranial disorders is likewise worthy of investigation. But in the meanwhile the results of this work, both anatomical and clinical, lead us to believe that transorbital puncture of the gasserian ganglion furnishes a relatively simple means of securing block anesthesia for operations in the territory supplied by the trigeminus, fully justified in cases where general anesthesia is contraindicated.

Brain Tumor.—M. B. Porter (*Annals of Surgery,* November, 1921) discusses the surgical aspect of tumors of the brain, and concludes as follows: The term brain tumor should include all growths of whatever origin or nature, either in or on the brain. Brain tumor is essentially a surgical malady. Surgical intervention should follow promptly the diagnosis of brain tumor. Postponement of operation for the purpose of locating the tumor or in the hope of getting relief through autiluetic treatment or for the purpose of determining its character is seldom warranted. Better a comfortable, contented patient without a complete diagnosis than a dead or a blind patient with one. Exploration of the brain with a solid needle is a valuable aid in the localization of tumors and is free from danger if properly done. X ray or radium therapy should be used in all inoperable cases in which surgical removal is impossible, and after removal of malignant tumors.

Syphilis of the Nervous System.—Sidney I. Schwab (*Southern Medical Journal,* April, 1922) says that treatment of nervous syphilis is a matter about which too much time has been spent and too much debate has taken place. Mercury, iodides, arsphenamine or its kindred products, plus the general treatment, handling and direction of the patient are all the measures that can be used. In the use of all these methods, with the exception of iodides there is some risk to the patient. The intraspinal method of giving arsphenamine is the most dangerous and should be reserved for the cases in which there is no response to arsphenamine given in the ordinary way. Technical variations are of little consequence, and that procedure which produces the best results, which damages the nervous system the least, should be the one selected. The value of any method should be measured, first, by the general improvement of the patient, then by the disappearance or mitigation of symptoms in respect to the nervous system, third by the diminishing physical signs, and fourth by the various alterations in the chemical and microscopic tests.

Treatment of Myoclonias and of the Parkinson Symptom Complex Following Epidemic Encephalitis with Intravenous Injection of the Patient's Cerebrospinal Fluid. — I. Piticarlu (*Wiener klinische Wochenschrift,* May 11, 1922) states that the presence of antobidies in the cerebrospinal fluid in certain stages of so eminently an infectious disease as epidemic encephalitis cannot be doubted. The following technic was used: Ten c. c. of cerebrospinal fluid were withdrawn by a lumbar puncture, which were immediately injected into the cubital vein of the same patient. This was repeated every five to seven days until four injections were given in the light cases and seven in the severe cases. Shortly after the first injection a marked improvement of the symptoms was observed, at first showing a decrease in the severity and later disappearing completely or nearly so. The results in four cases reported were good.

Epidemic Encephalitis.—Approximately one-fourth of the cases of epidemic encephalitis seen by George E. Price (*American Journal of the Medical Sciences,* June, 1922) terminated fatally. Of the remaining three fourths, approximately sixty-one per cent. were left with persistent or permanent sequelæ. Relapses were of frequent occurrence, bore no definite relation to the severity of the initial symptoms and could occur several months after apparent recovery. Prognosis could not be determined from the character and intensity of the initial symptoms, as a patient with mild symptoms at the onset could have a fatal relapse, and sometimes patients presenting severe and massive initial symptoms recovered. Epidemic encephalitis is not infrequently associated at the onset with symptoms of nasopharyngeal infection, but bears no direct relation to true influenza. Age bears a definite relation to mortality, children and young adults standing the infection much better than those of middle life or old age. Change in the abdominal reflexes is a frequent and important symptom in epidemic encephalitis, probably not hitherto sufficiently emphasized. Epileptiform attacks may occur as the sole manifestation of the infection. Rest, quiet, and care in preventing too early activity on the part of the patient are essential in the treatment of epidemic encephalitis.

Colloidal Benzoin Reaction in the Cerebrospinal Fluid.—J. Henry Dible (*Lancet,* June 3, 1922) asserts that the negative reaction occurs in normal cerebrospinal fluid. The positive reaction indicates an alteration in the cerebrospinal fluid, probably of a syphilitic nature. An ambiguous reaction indicates a pathologic condition in the cerebrospinal fluid, but does not give any information as to its exact nature.

Chronic Meningococcus Septicemia.—Hugh J. Morgan (*Bulletin of the Johns Hopkins Hospital,* August, 1921) describes two cases of chronic meningococcus septicemia, in the first of which the blood culture was positive for meningococci on the forty-ninth day, seven days before the development of signs of meningitis. In the second case the blood culture was positive on the thirty-ninth day. Antimeningococcus serum was given intravenously and intraspinally to both patients, followed by serum sickness and recovery. The paper includes a review of the literature and an extensive bibliography covering the literature.

GASTROENTEROLOGY

The Excretion of Dyes in the Gastric Juice and the Bile.—F. Rosenthal and M. v. Falkenhausen (*Wiener klinische Wochenschrift,* May 11, 1922) show that in diseases of the liver parenchyma, the excretion of the leucobodies of methylene blue in the bile begins fifteen and thirty minutes after the subcutaneous injection of the dye—a period of time one-sixth to one-third as great as the shortest interval of dye excretion in the gastric juice. This justifies the conclusion that the first dye excretion by the stomach is no disturbing element within the diagnostically important time for chromocholoscopy. The first appearance of the methylene blue excretion by the stomach (after the subcutaneous injection of three c. c. of a two per cent. solution of methylene blue in physiological saline solution) does not fall within the period of time necessary for liver diagnosis with the same test.

The causes for the marked differences in the excretion of subcutaneously and intravenously injected methylene blue are mostly that with intravenous injection, the dye content of the blood rises transiently to higher concentrations and the threshold value of the excretion of mythelene blue is rapidly reached and exceeded; it is also possible that other conditions of excretion may exist for prepared dyes thrown directly into the circulation than for the chromogen of methylene blue, the time of first appearance in the bile of which was determined. No doubt, a concentration effect results in the excretion of methylene blue, as the dye is found not only in the urine, but also in the bile passages and in the stomach in higher concentration than in the blood serum.

The Relation of Chronic Intestinal Stasis to Chronic Amebic Colitis.—J. W. Jackson (*Medical Press,* May 3, 1922) says that chronic amebic colitis commonly occurs in countries where amebic dysentery is found and that it usually follows a primary attack of dysentery. Some recover and others become chronic with associated alternating constipation and diarrhea, sometimes with blood-stained mucus in the stools, flatulence and the signs of intestinal toxemia. These cases are often operated on for appendicitis and show pericolic membranes situated most frequently at the hepatic flexure. The result of the operation is usually satisfactory. The clinical signs and behavior of cases of chronic intestinal stasis simulate chronic amebic colitis, with the difference that intermittent dysenteric symptoms are also present. As a result of this finding the author is led to believe that fundamentally the same condition is present in both diseases plus the infectious dysentery. In chronic colitis there is a history of a longstanding irregularity of bowel action previous to the dysenteric infection and these cases develop chronic colitis because of some degree of stasis, which allows the dysentery to establish itself, particularly in the same places as where stasis occurs—at the cecum, hepatic and splenic flexures and the sigmoid. The improvement after operation is due to the relief of stasis following the removal of the controlling appendix and the freeing of the various kinks of the colon.

Treatment of Linitis Plastica.—Palmer, Watkins, and Mills (*Surgery, Gynecology, and Obstetrics,* September, 1922) give the following treatment for what is commonly called cirrhosis of the stomach: The disease is amenable to surgical procedures only. Gastrectomy is the operation of choice. If the patient is feeble, the twostage operation is advisable, that is, a preliminary gastroenterostomy and a second gastrectomy. The anterior Polya operation is the procedure of choice, if the patient's condition will permit of a single operation. This operation can be done more rapidly, and is easier for the operator. The mortality rate is about the same as in various other gastrectomies and there is less postoperative disturbance and greater comfort after this procedure. If a total gastrectomy is performed, esophagojejunal anastomosis should be done. Satisfactory results have followed this procedure.

Detection of Incipient Jaundice.—Roumaillac (*Journal de médecine de Bordeaux,* March 25, 1922) notes that a subicteric discoloration of the skin may be so slight as easily to escape notice, yet constitute useful evidence of hepatic disorder or of an oncoming gastric or intestinal attack. To bring out the discoloration more plainly he makes a streak with purple ink on the anterior surface of the patient's wrist. By color contrast, the bands of skin adjoining the purple line at once take on a distinct yellowish color when incipient jaundice exists, even before the latter can be seen on the mucous membranes.

Ethereal Extract of Strawberries for the Treatment of Sprue.—Aldo Castellani and K. C. Browning (*British Medical Journal,* May 6, 1922) tried the use of an ethereal extract of strawberries in five grain doses given three or four times a day in two cases of typical sprue, in conjunction with the usual milk diet and alkaline treatment. The improvement of the general condition appeared to be hastened.

Glossopyrosis.—K. Heberden Beall (*Southern Medical Journal,* April, 1922) reports four cases in which a constant burning of the tongue was the sole symptom, and in which the results of physical examination were negative. In all of these cases there was an absence from the dietary of meat and whole milk. Two cases were lost sight of. The other two were relieved of the burning of the tongue by the addition of meat and whole milk to the diet.

Entamebic Disease.—G. C. Kilpatrick (*Southern Medical Journal,* April, 1922) maintains that the fact that endameba dysenteriæ cannot multiply outside the human body, and that the "progress of the contagion is very slow under normal conditions of sanitation," does not lessen the danger to the public health today while one at least in every twenty-five in the United States is infected. The danger is great so long as physicians fail to recognize amebic diarrhea, or at best attempt to eradicate it with emetin. Emetin hydrochlorid is a dangerous drug. Its chief value is in the treatment of infections in direct proportion to the acuteness shown, and as a diagnostic measure, and it should be so used only. Less emetin and more powdered ipecac root means more cures and fewer liver abscesses.

CARDIOVASCULAR

Value of Pulse Charts in Acute Carditis in Childhood.—Robert Hutchinson (*Lancet,* June 3, 1922) states that a study of the pulse rate is a great help in the diagnosis of rheumatic endocarditis, especially in the recurrent forms. If there is no fresh attack of endocarditis, the pulse and temperature curves remain roughly parallel and fall together under treatment with salicylates, but if a fresh attack has supervened, the pulse curve remains high after the temperature has reached normal, except in the mildest and most insidious cases. In myocarditis, as well as in endocarditis, the physical signs are indeterminate, but the greater the enlargement of the heart and the increase in rate, the more is the myocardium involved. Pericarditis is a later manifestation and rarely ever occurs without endocarditis and myocarditis, with their accompanying signs. In acute carditis the pulse chart is the best guide as to the progress of the case. The temperature curve may be normal throughout, as this is an afebrile condition. In active states the pulse rate is accelerated, only falling as the disease subsides, and any recrudescence shows a fresh rise of the pulse.

Prophylaxis and Treatment of Arteriosclerosis.—George S. Young (*Canadian Journal of Medicine and Surgery,* July, 1922) prescribes small doses of potassium iodide, not more than two or three grains three times a day for long periods of time with short interruptions in cases of essential hypertension, with or without arteriosclerosis, and in other types of arterial disease. Until recently this treatment has been empirical, but lately it has been shown that solutions of potassium iodide applied locally dilate the capillaries, and possibly this is what occurs when the drug is given internally.

Aneurysms of the Thoracic Aorta Involving the Lung.—James Fanning (*British Medical Journal,* May 13, 1922) reports two cases of aneurysm of the thoracic aorta which ruptured while under observation, the aneurysmal sacs producing extensive pulmonary changes. The strength of the sac in each case was the dense lining of laminated clot. The origin of the bleeding in one case was the remains of the bronchioles communicating with the sac, whereas in the second case it was the lung and esophagus. Another remarkable feature was the extent of the pathological changes in the thoracic aorta without affection of the cardiac musculature—no hypertrophy or dilatation. Clinically, the second case, showing progressive wasting, cough and hemoptysis with physical signs at the pulmonary apex, simulated chronic pulmonary tuberculosis with cavitation. A slight pulsation was attributed to pulsation of the base of the heart, uncovered by retracted lung; the hemorrhage (hematemesis and melena) was ascribed to blood swallowed from the lung.

Subclavian Aneurysm with Cervical Ribs.—C. A. Moore (*Lancet,* May 27, 1922) reports a true case of a subclavian aneurysm in a man, fifty-five years old, who complained of nothing but a cough. There was a pulsating swelling above the left clavicle, a general fullness in the lower part of the left posterior triangle with a small visible prominence above the clavicle, which could be grasped and moved laterally, but in close relation to the underlying artery. Proximal pressure on the artery caused collapse of the swelling. Internally to it, a cervical rib could be easily felt; there was another one on the opposite side, both being seen in röntgenograms. During the period of observation, the swelling increased in size and pain was felt down the inner side of the upper arm. The Wassermann test was triple positive. The operation revealed it to be a saccular diverticulum as large as a cherry, springing from the third part of the subclavian artery, which was otherwise normal. The wall was thin and the sac could be emptied by compression. The cervical rib was excised and a kangaroo tendon ligature was placed on either side of the sac. Recovery was uneventful.

Value of Quinidine in Auricular Fibrillation and Methods of Studying the Clinical Reaction.—Thomas Lewis (*American Journal of the Medical Sciences,* June, 1922) says that the percentage of cases in which quinidine, as used at the present time, will restore the normal rhythm in chronic fibrillation of the auricles is approximately fifty per cent. From the clinical viewpoint the usefulness of the drug is limited fifty per cent. by the high percentage of failures to restore the normal rhythm, but probably this percentage will be reduced with wider experience. It is limited also by its unsuitability in cases of venous stasis.

Aortic Dilatation and Aneurysm.—Wallace Wilson (*Canadian Medical Association Journal,* May, 1922) says that as the first step in treatment it is probably advisable that every patient should be put to bed. Syphilis should be sought for and treated if found. All possible foci of infection should be eliminated where possible. Diet is not of primary importance except in syphilitics. In cases with an associated high blood pressure nitrogenous intake should be restricted, and some will be benefited by electricity in the form of autocondensation. Sudden short severe muscular effort, constipation with straining at stool, and anything else tending to raise the blood pressure, should be avoided. No man with an enlarged aorta should engage in heavy manual labor, or be subjected to severe mental strain or worry.

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GENITOURINARY

Value of Tests with Commercial Luetin.—Harry E. Anderson (*Archives of Dermatology and Syphilology,* May, 1922) emphasizes the public importance of determining the quality of luetin available in the open market, for his experiences on the California state board have convinced him that a large number of physicians place reliance on the results of the luetin test as a criterion of cure. It was therefore decided to test the properties of luetin produced by the three large manufacturers which constitute the sole source of supply. Reference is made to Noguchi's original work and the three types of positive reactions—the papular, pustular, and delayed or torpid forms—are described. A positive reaction is explained as being due to a state of allergy or increased susceptibility of the tissues of syphilitic persons to Spirocheta pallida. A review of the literature shows that luetin has been generally accepted by authorities to be of value in the diagnosis of late, congenital and latent syphilis, when drugs are not taken. The author's investigations were carried out on fifty-three cases. The large number of failures of the luetin test in selected cases, known to be syphilitic, clinically or serologically, suggests that luetin purchased in the open market may be inert.

Experimental Polyuria.—McMicken Hanchett (*American Journal of the Medical Sciences,* May, 1922) arrives at the following conclusions: Clinical evidence, though indefinite, indicates that neither increased nor decreased activity of any portion of the hypophysis is uniformly associated with polyuria. Experimental lesions of the hypophysis itself are not constant in the production of polyuria. Some additional element is the determining factor. Experimental lesions of the hypophysis, similar to those producing negligible excretory changes, when associated with traction upon its attachment to the floor of the third ventricle uniformly produced polyuria. The degree of polyuria was roughly in proportion to the amount of traction. Polyuria associated with hypophyseal changes is due to stimulation of the regional base of the brain, floor of the ventricle, corpora mamillaria, etc. Intravenous injections of pituitrin temporarily lowered the excretory rate in a polyuria thus produced. Intravenous injections of epinephrine have no effect on polyuria of this type in dogs.

ENDOCRINOLOGY

Solution of the Endemic Goitre Problem.—H. G. Sloan (*Southern Medical Journal,* March, 1922) says that the prophylactic use of iodine has completely eradicated goitre in certain domestic animals in goitre districts where formerly the goitre incidence in these animals was high. A like prophylactic measure with iodine is equally applicable in man, and has gained great momentum during the last two years. He asserts that when it is once generally instituted goitre belts will cease to exist and a cretin will become a medical curiosity. He says: "Adenomata would be eradicated in the second generation if gravid mothers were given iodine; carcinoma of the thyroid would be almost wiped out; and the incidence of exophthalmic goitre would markedly decrease." One may picture the time when national legislation will demand that all salt for family use which comes into a goitre district must contain iodine.

Immediate Recovery from Early Diabetes Insipidus after Lumbar Puncture.—John Tucker (*American Journal of the Medical Sciences,* May, 1922) reports a case of the sudden onset of diabetes insipidus without immediate preceding illness, in which the subjective symptoms were a sense of discomfort behind the glabella, increased thirst, a great urine output, and marked sweating. Physical examination revealed involvement of certain cranial nerves on the left side. Within twenty-four hours after lumbar puncture the great thirst was relieved, the urinary output was reduced to normal, and the sweating ceased. Examination five and a half months after the onset of the diabetes gave negative findings with the exception of laboratory evidence for hypopituitarism, revealed by the high sugar tolerance.

Increased Effect of Cocaine from Hypertonic Glucose Solution.—W. Zemann (*Wiener klinische Wochenschrift,* April 27, 1922) has found that the addition of a hypertonic (ten per cent.) glucose solution to cocaine increases its effect, prolongs the duration of the anesthesia, but diminishes the anemia produced by the cocaine in otorhinolaryngological surgery. He used the Braun 0.5 per cent. novocaine suprarenin solution (in 0.37 per cent. sodium chloride solution) with equal and double amounts of ten per cent. glucose solution for infiltration anesthesia in operations for deviation of the nasal septum and tonsillectomy. With these dilutions the analgesia was equal to that of 0.5 per cent. novocaine suprarenin solution; further dilutions lose the anesthetic effect. The onset of the analgesia is retarded but its duration is prolonged. This effect is particularly desirable in tonsillectomy, the afterpains appearing later and being less severe.

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Some Deficiencies of Modern Therapeutics*

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The time is ripe for a serious examination and a deep consciousness of the true situation with regard to therapeutics in this country. It is generally conceded that since the discovery of the bacteriological causes of disease, preventive and experimental medicine have taken precedence over the care and treatment of disease.

The object of this paper is not to disparage laboratory methods having for their objects prevention and cure, since these should ever hold first place, but to point out present day deficiencies which have been the result, in part at least, of the dominating trend toward research and refined methods of diagnosis and special cures, to the neglect of therapeutics directed by reasonable viewpoints. We should ever keep in mind that therapeutic advances in their last analysis rest upon clinical observation at the bedside. True it is that some of our best and most useful modern remedies are the product of laboratory investigation, but their true value as therapeutic agents is finally determined by the observant clinician.

Rational therapeutics appeals to the laboratory, to hygiene, to physiology, to pathological physiology, to pharmacology, and diagnosis, and with the assistance of these branches of medical science, it can meet individual cases of disease intelligently. Fortunately, the era of therapeutic nihilism, which had prevailed for several decades, may be said to have passed. Its effects, however, are still upon us, since it had invited the origin and rendered popular some of the many cults with which we are plagued at the present time.

One of the defects in the modern program is our failure as a profession to acquaint the general public with the results of laboratory investigation bearing upon the prevention and treatment of disease. On the other hand, if this were done it would be appreciated by the public and the laity would also, as a consequence, assume a more interested attitude toward scientific medicine. It might be argued that this would be too large a contract, but the writer believes it would be entirely feasible, if the right spirit was in the profession—in us; he feels strongly that individual physicians and the organized profession should teach the simple truths discovered by the laboratory, which truths if appreciated and heeded by the public, would contribute mightily to the health, happiness and comfort of the human race.

Again, while recognizing the limitations of drug therapy, except in a few diseases for which there is a cure, there should be less pessimism displayed by the profession toward socalled symptomatic treatment. I am not among those who assert that too much effort is being bestowed upon the question of the relief of symptoms, since by this course we promote greatly the relief and welfare of patients.

Moreover, in meeting symptoms, an attempt should always be made to trace them back to their causes; this is the aim of pathological physiology—a branch of pathology which has been sadly neglected by practitioners of medicine. Morbid anatomy and pathological physiology rightly understood, enable us to treat the causes of symptoms, and it is along this path that real success in treatment lies. True it is that there are many pathological conditions that therapy cannot change, but it is equally true that a considerable number yield readily to appropriate hygienic measures, sera, vaccines, and drugs. Among the latter may be instanced such diseases as syphilis, tuberculosis, myxedema, diphtheria, anthrax, tetanus, cholera, yellow fever, and malaria, as well as metabolic disorders. The medical profession needs to learn the lesson that symptoms of diseased conditions result from abnormal physiology and that the intelligent practice of the art of therapeutics must be based upon the results of a correlation of clinical phenomena with their underlying causes.

The true physician is devoted to the alleviation of suffering and cure of disease and to this end he not only individualizes the cases that fall under his observation, but also calls upon all of the resources at

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his command. He looks to the laboratory and the other branches of medical science mentioned above for aid, and if his power to interpret the information he receives is adequate, often obtains real and ample help.

In general, however, it may be justly claimed that the profession has failed to take advantage of certain recognized therapeutic aids in recent times. The causes for this situation are several and some of them at least lie deep. In the first place the training of undergraduate students in therapeutics from a practical viewpoint has not kept pace with the progress and evolution of medicine as a science. Again, during the quest for cures and prophylactic sera, certain other restorative measures have been sadly neglected by those charged with the education of students in this important branch of medicine. For example, too little attention has been devoted to physiotherapy, and as a consequence opportunity has been given for the birth and development of cults, whose only resources are physical measures.

As stated elsewhere, "For the faults of the present status of therapeutics, the regular profession is to be held largely responsible" (1). Unfortunately, the form of physiotherapy masquerading under the name of osteopathy "pretends to be a system supplanting all internal medicine and as such is teaching its patrons false doctrines and estranging them from the broad principles of medicine" (2). Since the birth of osteopathy, many other mongrels have come into being, including chiropractic, which is quite the vogue at present. Doubtless the medical schools could accomplish a great deal in providing suitable opportunities for the training of students in the different branches of physiotherapy.

Again, with a view to meeting the menace of the drugless cults and "pathies" to legitimate medical practice, the regular profession should promptly accord to physical measures their proper place in the management of disease. The fact is not as generally recognized by the American profession as by those of other nations that physiotherapy, including hydrology, has an important sphere of therapeutic usefulness.

The present day practitioner is lacking in conversancy with some of the older conventional measures and methods, which gave hope and encouragement to the patient. As Pottenger has well said in discussing therapeutic nihilism, "One of medicine's great mistakes has been its failure to recognize that there are two factors to be considered as regards treatment, the patient and the disease, and to give each the consideration which it deserves." Unquestionably, there is wisdom in considering the patient and manifesting interest in, and sympathy for, him in his illness.

Without overindulging the follies of patients, the physician's success is due in no small part to much attention and kindly sympathy—"a sympathy that is expressed in the manner rather than in the spoken word" (S. Weir Mitchell). The practitioner's aim should be to maintain a just balance between the modern scientific, progressive, and preventive methods and the more practical, humane aspect of the art of therapeutics of bygone days.

Unquestionably, the line of direction of modern therapy has been away from applied psychology, which enables student and practitioner to meet the almost universally pessimistic attitude of patients. We must not lose sight of the fact that the instillation of optimism will bring hope and cheer, will invigorate rather than depress vital function, will increase rather than decrease resistance to disease. Truly, optimism is often one of the best tonics that can be prescribed.

Again, the practitioner should establish and maintain a system of instruction in personal hygiene and physiology for the benefit of his patients and the community. If the profession were to adopt this suggestion, the interest and cooperation of the public could be enlisted to a far greater extent than is the case at present. The practising physician, therefore, should also be a teacher, and he need not hesitate to instruct his patients in the various cults, pointing out the absurdity of their claims, giving facts to prove his position, which facts are not far to seek.

Not only are physicians prone to neglect the physical and psychical, but also the hygienic and dietetic treatment of disease. Carelessness in regard to an investigation into the patient's habits as to eating, the use of tobacco, alcohol, tea, and coffee, is often the cause of failure to relieve the neurasthenic and dyspeptic.

It is quite gratifying to note that a recent work on the *Principles of Therapeutics,* by Dr. Oliver T. Osborne, devotes not less than fifty-six pages to food and diets and to general physical measures all of seventy-eight pages. This author well says, "It must now be the object of every physician to modify, if possible, disturbances of the system by changes in the food and drink before drugs are called upon for aid" (3). To sum up my reference to diet, it may be said with truth that it receives too little consideration in the treatment of disease and that this is one of the chief reasons for failure in the domain of hygienic management of disease.

Leaving the discussion of the broad subject of focal infection on one side, for lack of space, and admitting that its just recognition and rational management marks an important step in the evolution of therapeutics, the profession has recently passed through a season—not yet a thing of the past—of the reckless extraction of teeth and the unwarranted removal of tonsils. The usual tonsil operation is complete removal, even though one or both tonsils are diseased only in part. This position is scarcely tenable, although all distinctly, or obviously, pathological tonsillar tissue should be removed.

Attention will be called to another defect in the modern professional program since it has a potent effect upon the character of medical service, including therapeutics, rendered to the public. It has been said that the rich and the poor are taken care of, while the large middle class of society is not in a position to obtain the services to which it is entitled. This huge mass of humanity is selfsupporting and desirous of paying a moderate fee for medical services, but cannot well afford the high charges of a group of specialists, when demanded by the exigencies of a given case. It is this large class to which the general practitioner ministers, and from which those who practise cults and pathies in large measure derive their support.

Now, the explanation of failure to give a first class quality of service, especially in rural districts and small communities, is to be found in certain handicaps, under which the physicians of those localities are obliged to carry on their professional work. Try as they may, unless graduated in recent years, they will find themselves retrograding because of being out of touch with modern laboratory methods, instruments of precision, and the like. Again, the positive scarcity of medical men engaged in general practice in these districts, tends to bring about a superficial, inferior form of service, on account of the large, widely scattered clientele that they are called upon to serve. This is quite as true of the therapeutic, as of the diagnostic, side of the service which they render.

The question arises, Is there a remedy for this unfortunate situation? In the first place be it recollected that success and growth cannot be attained by pursuing the old, conventional, beaten, narrow course at present writing. The modern requirements of society call for a physician, who is socially useful, one who is identified with civic welfare movements and health centres, and above all one who not only belongs to, or is a regular attendant upon the meetings of, but is also an active participant in, his county medical society.

He can promote his own professional and material interests, as well as render more effective service to the public by official connection with a local hospital with a well equipped laboratory, or as an examiner for high class insurance companies. More important still, he should periodically, at least, seek the advantages offered for graduate instruction by our medical schools, especially those properly organized for the purpose, e. g., the University of Pennsylvania and by our county medical societies.

The presentation of courses of practical instruction by county societies or councilor districts should, it seems to me, be advised and encouraged. The dean of the Graduate School of Medicine of the University of Pennsylvania, Dr. Meeker, and a committee appointed by the state medical society, are carefully considering at present a comprehensvie program with a view of establishing socalled medical extension education throughout this commonwealth. The plan includes, among other features, the formation of groups of physicians at favorable localities, "Each member of the group being regularly registered as an extension student, the courses to be conducted in hospitals and based on diagnoses, prognoses and recommendations as to the best medical and surgical procedure."

Says Dr. de Schweinitz in his masterful presidential address before the American Medical Association at St. Louis, May 22d, pertinently to the subject under discussion: "The recent graduate stationed in the country, lest he suffer a disastrous eclipse, must keep in practical touch with new developments, in diagnosis and treatment, and moreover, his patients are insistent that he shall do so. He cannot leave his duties to seek such information and instruction in distant centres; hence methods are being devised whereby such facilities shall be brought to him in an endeavor to satisfy the practitioner's laudable ambition and his requirements, as well as the desires of his clientele."

Medical extension education rightly organized and conducted would make rural practice and that of small towns and villages infinitely more attractive to recent graduates and serve to improve decidedly the service rendered to the great middle class of society everywhere. Among the many subjects that should be stressed in such a course is that of endocrine disorders and their treatment. It is axiomatic that success in treatment presupposes accurate diagnosis. The average physician's knowledge, however, of this group of conditions is confessedly scanty and hence he is content to employ one of the numerous, freely advertised, organic products, or more commonly pluriglandular compounds, which he feels may relieve the obscure affection with which he is dealing.

There are a number of endocrine preparations which have positive therapeutic value, hence the importance of noting the signs and symptoms of the misfunction of the glands from which they are derived. Osborne has well said, "A careful study of the activities of the endocrine glands is very profitable for both physician and patient, as the right treatment for the cure of his abnormal condition may thus be made evident."

Sajous has repeatedly expressed, within my hearing, the view that the knowledge of the endocrines that is available is not utilized in practise for the reason that the known facts represent a large number of discordant and uncorrelated opinions. What he has so well accomplished through his extensive writings, by searching analysis and constructive deductions in this field, has been bringing order out of chaos, and will, it is hoped, ultimately serve as a guide for practitioners.

These medical extension courses should also stress the subject of the rational use of sera and vaccines, the empirical method having been too generally employed in the past in connection with their uses in the treatment of diseases. From certain of the foregoing facts, it is obvious that advantage should be also taken of the opportunity offered by this plan to teach physiotherapy to the practising physician, thus overcoming one of his chief deficiencies, as regards the treatment of disease.

CONCLUSIONS.

In concluding, it will be observed that the consequences of our therapeutic deficiencies have been and still are quite serious, and the foregoing discussion, it seems to me, justifies certain inferences, as follows:

1. Efforts to acquaint the public with the facts discovered by experimental research should be systematically carried on by individual physicians and professional organizations.

2. Rational therapeutics calls upon physiology and physiological pathology, in particular, for aid.

3. Physiotherapy and applied psychology have in recent times been neglected in the treatment of disease, permitting of the birth and growing popularity of cults.

4. Our undergraduate medical schools have failed

to stress sufficiently physical measures and also the patient, apart from his disease, as regards treatment.

5. There has been too little effort to establish and maintain personal instruction of patients in hygiene and physiology on the part of practitioners.

6. A higher grade of service is demanded for the large middle class of society in rural districts and small communities, showing the urgent need of medical extension education.

7. The need of improved teaching of endocrinology and more especially of those glandular products that have recognized positive value.

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Pharmacoendocrinology as a Foundation for Rapid Progress in Therapeutics*

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Although the wave of therapeutic nihilism which swept this and other continents at the close of the nineteenth and beginning of the twentieth centuries has now about spent its force, its aftermath remains. Numerous drugless cults, eighteen I am told, now sweep this country from end to end, which make it possible for any individual, often coarse and ignorant, to minister to the sick, regardless of pathology or possible complications and death. That nihilism also warranted their birthright, the modicum of truth which each contains having been cast aside without study or trial, is probable. The fact remains, however, that the aggregate of cult practitioners in this country alone is said to equal now at least that of the entire medical profession, and to be constantly growing. While our medical schools, staggering under their burden of overhead charges, are unable to train but a limited number of men, even though towns by the score in certain states are clamoring for physicians, cult schools are developing on all sides, freely, cheaply, and promptly filling all niches and more with their products. Blind legislation aiding, the ultimate result can easily be predicted.

How can our profession protect the public, and also itself for public good, against this deplorable state of things? After all, the ultimate aim of our professional endeavor is to prevent suffering and death by disease. If this thought is thoroughly apprehended, we need fear nothing. An adequate medical education enables us correspondingly better than the limited requirements of cult training to develop, as is constantly being done, our professional efficiency in every direction. As the result of an experience in endocrinology probably exceeding that of any living man, I have no hesitation in stating that endocrinology is destined if the vast literature on record is properly and justly interpreted, to develop therapeutics—which, after all, is to the physician what the gun is to the soldier—far more rapidly than is now the case, while also promoting progress of several promising remedial methods now being scientifically investigated.

Twenty years ago I submitted before this society the first testimony to the effect that certain ductless glands were the organs through which Nature sustained life and defended it, and also that many remedies used daily by the practitioner produced their beneficial effects through the intermediary of these organs. I now submit to you evidence to this effect by means of a few examples, and hope that it will convince you that by cooperative endeavor we shall soon be able to undo the harm that therapeutic nihilism has done.

Of late, particularly, you have read numerous ominously unfavorable comments on endocrinology, one of our authorities going so far as to state that "nothing" was "about the sum of human knowledge as to the ductless glands with the exception of the thyroid.". Indeed, the prevailing endocrinology of physiologists, pathologists, biochemists, etc., upon whom clinicians and therapeutists have depended for fundamental principles and premises, cannot on final analysis be characterized otherwise today than as a chaos, or as "a confusion," as Halsted, of Johns Hopkins, characterized it a few years ago. From my viewpoint, however, this is the result of a defective, and therefore misleading method of study in which each of the many branches of medical research which contribute to endocrinology stands apart, isolated, from all others. Briefly stated, what is styled endocrinology today, is but a litter of weaklings, physiological, pathological, clinical, biochemical, etc., none of which is able to stand alone or to thrive. Hence their vulnerability. Yet, is such a result compatible with reason after the sixty and odd years of labor by thousands of investigators, many of the first order, since Claude Bernard inaugurated modern endocrinology?

Indeed it is not the endocrinology I outlined before you twenty years ago, nor the endocrinology I have defended ever since. Hence the fact that my views have always, as far as fundamental functions were concerned, differed from those of other workers in the endocrinological field. And why? It is because I saw from the very start that no single branch of medical knowledge could alone solve so vast a problem as endocrinology and that this could only be done by amalgamating, as it were, all available knowledge capable of shedding light on the subject. Far greater in scope, since I also concluded from the start that it would influence the whole domain of physiology, clinical pathology and therapeutics, endocrinology, as I interpreted it, was the product of a simultaneous study of all the branches of medical knowledge (over thirty) for what data they would furnish, pro or con, to elucidate the question analyzed. Each deduction thus constituted, as it were, a mosaic of all work done on the subject studied. The fact that my two initial volumes on the internal secretions contained over four thousand references, even these representing but a part of the data collected, bespeaks the amount of labor done in so far as literature was concerned—irrespective of all laboratory and clinical work.

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* Part of symposium on modern therapeutics read before the Philadelphia County Medical Society, June 14, 1922.

The elucidative value of concomitant study of the recorded data of many branches, with coordination, analysis and synthesis of all those germain to the subject studied, is undoubtedly greater, more fruitful and rapid in results, than the prevailing short cut and withal slow system of trying to solve a problem by means of a few experiments. Such experiments, which very seldom and usually by mere chance hit the mark, are thus practically all wasted. As building stones for the great philosophical structure that any major medical problem represents, however, they are all, when carefully conducted, precious constructive assets. An instance of this fact is afforded by my study of the commonplace though obscure symptom of fever, the nature of which the eighty years of modern medical science had failed to reveal. In 1904 Lazarus Barlow (1) wrote in his *Textbook of Pathology:* "Even if we grant that fever is beneficial, we are completely ignorant of the manner in which it acts." Today pathologists are no wiser on the subject. Analysis of the question, however, demonstrated the need of elucidation from another branch, for in order to explain fever, a knowledge of tissue respiration was necessary. But here, again, I was thwarted, for physiology only afforded what Halliburton (2) recently (1921) wrote: "Our knowledge of tissue respiration is so scanty that we can say little of its pathological bearing." The endocrines, however, afforded the needed light, for in 1903 (3) I found that it was the secretion of the adrenals which carried on tissue respiration—a conclusion which has been sustained since on all sides, including many facts contributed by physiologists, and which, with data from other directions, afforded a clear explanation of fever, as will be shown later.

The cause of the persistent inability of pathologists to explain so ubiquitous a symptom as fever was well summarized by Sir James Mackenzie (4) when he wrote only last year: "The conception of medical research which is dominant today is so immature and imperfect that it renders fruitless much of the research work. Indeed, so imperfect is the conception that fields essential to medical progress are not recognized."

Another example may be submitted to emphasize the value of the system as a means to facilitate discoveries in various directions. The identity or nature of vitamines, as you are aware, has remained unknown despite the arduous efforts of biochemists during the last ten years. Having been asked a few months ago to write a paper on the subject for the American Therapeutic Society by Dr. Anders, its president, I must admit that it took but a few weeks to identify the only vitamine sought (because of its importance in infantile scorbutus, military and naval dietetics) the water soluble C (5). McCarrison (6) having found a marked deficiency of adrenalin in the suprarenal medulla and atrophy of all other endocrines, my own discovery of the rôle of the adrenal secretion in pulmonary and tissue respiration soon pointed to a study of the oxidases in animals and plants as the probable fruitful field of research. The data it furnished soon showed that the catalytic adrenal enzyme which fifteen years ago I had termed adrenoxidase and a plant ferment known as tyrosinase were one and the same thing, a fact then confirmed by the similarity of their biochemical characteristics. This showed that the tyrosin in certain foods was the same substance as adrenalin in man, also the antiscorbutic soluble C vitamine. What this means you may surmise by the fact that henceforth, instead of prolonged tests in animals, a few simple chemical tests will enable us to ascertain in a few minutes the antiscorbutic value of any food used for the artificial feeding of infants, for military and naval purposes, etc. These tests will be published in a forthcoming issue of this Journal. It will be shown, moreover, that socalled scurvy is in reality an advanced stage of oxygen deficiency observed in many adynamic diseases.

We will now test the method of research outlined in its bearing upon what I have termed pharmacoendocrinology and have defined as a knowledge of the manner in which drugs (and many other therapeutic measures, we shall see) influence the functional activity of the ductless glands, in addition to their other familiar pharmacological effects. The special importance of pharmacoendocrinology lies in the fact that it points to the manner in which our remedial measures cause Nature's own methods to fight disease—the aggressive instruments being the glandular hormones. In this connection permit me to impress upon you that by thus obtaining a deeper insight into Nature's methods, you will realize that all along you have, with ever increasing skill followed in her footsteps, and that it is now only a question of developing the efficiency of what you already know, that we shall by cooperation and mutual help raise the efficiency of therapeutics to a standard compatible with our aspirations.

PHARMACOENDOCRINOLOGY OF THYROID BODY.

While Vassale, in 1892, and Victor Horsley, in 1902, found that the thyroid secretion converted toxic products of metabolism into eliminable end products, my own labors indicated (1903-1907) that this hormone formed part of the body's antitoxins, and that it had bactericidal functions in the sense that it corresponded with Wright's opsonins, as a sensitizer of pathogenic organisms to the action of phagocytes. This has been repeatedly confirmed in France, Belgium, and Italy. The more recent experimental researches of McCarrison (7) have also led him to conclude that "the thyroid gland contributes largely to the body's antitoxic and bactericidal functions."

From the viewpoint of therapeutics, this defensive function—entirely overlooked in this country, unfortunately for sufferers—is of the greatest importance, since it is through its intermediary that some of our most efficient remedies produce their curative effects. Three groups of these agents will be described as examples of this fact, to prove to you that you have all along been pharmacoendocrinologists without knowing it.

Iodine and the iodides.—The iodine from foods is used by the thyroid for the elaboration of its secretion, but when iodine itself or its salts are administered the gland only absorbs, according to Marine, about 18.5 per cent. on an average. The defensive rôle of the organ is further emphasized in this connection by the fact that the remarkable therapeutic properties of the preparations of iodine manifest themselves mainly in disorders of bacterial origin: tertiary and congenital syphilis, peribronchial adenitis of tuberculous origin and surgical tuberculosis, chronic pleurisy and empyema, abscess, rheumatism of bacterial origin, etc. The well known influence of the thyroid hormone on the catabolic phase of metabolism must also be taken into account, however, for it is to this action that we owe the conversion of all bacterial toxins, endotoxins, etc., into eliminable end products. In some disorders, bronchial asthma, for instance, in which toxic intermediate wastes cause the bronchial spasm, it is to the increased catabolic activity of the thyroid hormone, fostered by the iodides administered, that the curative effects of the latter are due.

When you administer antitoxin in diphtheria, and in fact any antitoxic serum, you are likewise using, as one of its constituents, thyroid hormone, but derived from the animal from which the antitoxin was obtained as I pointed out in 1907. Since then Rupert Farrant (8) also concluded after an extensive investigation that there was "some close relationship between the thyroid function and the development of certain antitoxins." Again, you may recall that when Behring failed with his antitoxin, Roux made its use safe by adding iodine; but he unconsciously did far more than to render it aseptic, as he thought; he correspondingly increased its power to act on the organic phosphorus which all cells, particularly their nuclei, contain. He thus increased greatly the vital activity of the child's cellular life, besides accelerating metabolism in all those of its tissues concerned with the production of antibodies. Hence the striking value of antitoxin.

What is, however, the nature of this connection between the thyroid hormone and organic phosphorus? This brings us to another element, the fate of which in the body is admittedly unknown—mainly because, I may add, its functional relation with the thyroid has been overlooked.

Phosphorus.—This element found in all tissues, particularly in their nuclei, as just stated, in the myelin of all nerve cells, including the cerebral neurons, the leucocytes, the red corpuscles, etc., is so important to the body that, as shown experimentally long ago by Förster (9) and others since, deprivation of food phosphorus proves more rapidly fatal than actual starvation. That a direct connection exists between the thyroid hormone and the tissue phosphorus is shown by the fact, emphasized by Chittenden and other biochemists, that there is a marked increase in the excretion of phosphoric acid when thyroid gland is administered, and conversely, a marked decrease when the gland itself is removed. That such a biochemical connection is possible becomes evident when we recall that, as shown by Levene (10), Justus (11) and others, iodine is also present in all tissues. When thyroid gland is administered, however, particularly in hypothyroidism, there is a marked increase in the oxygen intake. In the light of laboratory experience this is due to an increased consumption of this gas throughout the body because the iodine in the thyroid hormone acts as a catalytic, thus causing rapid oxidation of the phosphorus in all tissue cells, and a corresponding increase of heat energy and vital activity.

This accounts for the therapeutic results you are obtaining from phosphorus and its preparations. In all mental and nervous disorders of a purely adynamic type and devoid of organic lesions, neurasthenia due to overwork, anxiety, sexual excesses, neuralgias, etc., when administered with potassium iodide or desiccated thyroid, which sensitizes phosphorus and strychnine, and which, we shall see, increases the oxygen supply, it is especially effective. In adynamic children this treatment, using lecithin as a source of phosphorus, and in osseous disorders, osteomyelitis, bone tuberculosis particularly, this combination is very efficient.

Arsenic.—The therapeutic importance of this agent has been further increased by the introduction of arsenical products, salvarsan, arsphenamin, etc., in the treatment of syphilis. The additional knowledge this has afforded has confirmed my own words of 1907, to the effect that "arsenic in small therapeutic doses causes slight general vasodilatation. As the calibre of the cutaneous arterioles is likewise increased, the capillaries of the skin, among others, receive a greater influx of autoantitoxin laden arterial blood." So striking are these effects that they have since been termed nitritoid by syphilologists, the nitrites, as is well known, also producing dilatation of the arterioles. The edematous swelling of excessive dosage bespeaks this condition. To it also may be traced the many and various complications sometimes observed when the new arsenicals are used. These may consist of mere flushing to extreme redness of the face; the skin being infiltrated with blood at first, its melanins may cause jaundice even to bronzing, recalling Addison's disease. Hyperemia of the nerves may give rise to polyneuritis; of the joints, to polyarthritis; of the brain and meninges, to convulsions and encephalomyelitis; of the kidneys, to hematuria, urobilinuria and even renal necrosis and many other untoward phenomena. Hence the fact that adrenalin, which as effectively constricts the arterioles, has been found to be the best physiological prophylactic.

In the light of this explanation, the treatment of the many disorders in which arsenic is used may be greatly improved by giving thyroid gland simultaneously. This does not apply, however, where there is cutaneous inflammation, since by opening the arterial sluices we would increase the inflammatory process. It is indicated in chronic disorders, the thyroid gland greatly aiding the bacterial and antitoxic effects of the blood (which tend to be hampered by the arsenic) thus increasing correspondingly the chances of success. Suprarenal preparations should be avoided in such cases; they would only prevent the dilatation of the arterioles and the admission of antibodies to the cutaneous tissues. The value of arsenic in malarial fever is due to a process similar to that in skin diseases. But in pernicious anemia, where arsenic is our best agent, thyroid gland or the iodides should be avoided, for it is by its inhibiting influence upon the thyroid that arsenic lowers the hemolytic action of the blood.

PHARMACOENDOCRINOLOGY OF ADRENALS.

That so competent a physiologist as Swale Vincent (12) should have been led to conclude five years ago, sixty years after Brown-Séquard's initial labors on the adrenals, that "we know nothing of the functions of the adrenal body regarded as an organ on its own account," despite the great labor devoted to the study of these functions, cannot but suggest that physiologists have overlooked some function of the adrenals which would cause their researches to appear in a more favorable light. What this means to us clinicians is that we have been deprived of the fundamental function underlying the genesis of pathological phenomena on all sides, including, as we have seen, fever, that ubiquitous symptom of hundreds of diseases, and also autolysis, the underlying cause of death in the great killers of humanity, and which is quite as obscure.

As previously stated, I pointed out in 1903 that the secretion of the adrenals carried on pulmonary and tissue respiration by taking up the oxygen from the air in the lungs and then becoming part of the hemoglobin molecule. I will not burden you with a mass of evidence which is readily obtainable elsewhere (3), but merely recall that the soundness of this conclusion has been sustained since from all directions by evidence furnished unconsciously by investigators in medical science.

The control of the adrenals thus becomes an all important factor of morbid processes when oxidation, the fundamental function of organic efficiency, becomes deficient or excessive. But here considerable circumspection is required, for while the adrenals sustain oxidation this represents therapeutically the upbuilding or anabolic phase of metabolism, while the thyroid carries on the breaking down or catabolic phase of this process, as is well shown by its fat reducing effects. Adrenal stimulation comes in advantageously, therefore, where adynamia, exhaustion, i. e., slowed metabolism prevail.

Strychnine.—The use of strychnine in atonic paralyses, myasthenias, neurasthenias, cerebral anemias, depressive insanities, etc., also in the debility following influenza, is well known. In 1903 and 1907 and several times since (13) I pointed to this agent as a direct adrenal stimulant. In 1919 Stewart and Rogoff (14), confirming this view in an elaborate laboratory study, found that even therapeutic doses caused a marked and lasting increase of adrenal secretion. What this means in practice becomes apparent when we realize the fact noted by Brown-Séquard, that the adrenal secretion contributed to the cardiac dynamism, a conclusion sustained and greatly developed by Oliver and Schäfer in 1894. When, as we have seen, the secretion reaches the lungs, it takes up the oxygen of the air, and as a constituent of hemoglobin activates oxidation in all tissues, including the entire nervous system, the sympathetic in particular. When, therefore, we administer strychnine or nux vomica, we actually increase the volume of oxygen admitted into all tissues, their very *pabulum vitæ,* provided the adrenals are functionally efficient.

Since I urged in 1903 and 1907 (15) the importance of considering the nervous system as the seat of oxidation carried on as elsewhere by the adrenal oxidizing ferment (the study including over one hundred pages on the biochemistry and histology of the nerve cell and fifteen illustrations) various investigators, Tashiro in particular (16), found that nerve fibres were the seat of a metabolism as active as that of any tissue of the body, the brain and ganglia especially so. This illustrates anew the value of synthetic study of available data for the elucidation of obscure problems, for my deductions were reached many years before this confirmatory evidence was obtained. Hence the recognized therapeutic value of strychnine in all neuroses of an adynamic type, for by stimulating the adrenals it enhances correspondingly metabolism in the nervous system.

Digitalis.—This drug, as I have long urged (17), includes, among its effects, stimulation of the adrenals. Bezold, Traube, and Boehm (18) found many years ago that section of the spinal cord high up not only annulled the effects of digitalis, but also caused these effects to cease when they had become manifest. Since then I found that this part of the cord gave passage to spinal paths which passed into the splanchnic, thence to the adrenals. This was confirmed recently by Stewart and Rogoff (19), A. N. Richards and W. G. Wood (20), who found that both strophanthine and digitoxine produced effects indistinguishable from those of adrenalin. They also noted that this action could no longer be obtained after section of the spinal cord high up and that it ceased when the splanchnic, which carries the secretory nerves to the adrenals, was cut.

The bearing of these facts on the treatment of cardiac decompensation is important, particularly where digitalis is not well borne; for small doses, reinforced with strychnine, which acts through the adrenals, on the heart alone, will then act as efficiently as large doses. The fact that adrenalin and digitalis act similarly accounts for the frequently recorded observation that the latter agent is inefficient in acute infections. This is because the adrenals, being active participants in the febrile process to raise tissue oxidation, are already overactive. The digitalis not only urges these organs unnecessarily, but tends to exhaust them. The aim in fact should be to aid them by injecting adrenalin, seven drops of the one in one thousand solution in a syringeful of saline solution intramuscularly.

Nitrites.—We have seen that strychnine and digitalis, and to a less marked degree their congeners, stimulate the adrenals, among their other effects. But we also have drugs which counteract excessive functional activity of these organs. Prominent among these are the nitrites. As is well known the adrenal hormone causes constriction of the arterioles. When the adrenals are overstimulated, as in the early stages of ether anesthesia, heart failure may occur because of the back pressure of the blood upon the heart caused by the constricted peripheral bloodvessels. In this condition it is customary to inject strychnine, caffeine, etc., to restore cardiac action. Is this wise? Pharmacoendocrinology shows that it is not, for these agents only add fuel to the fire by stimulating the adrenals. What is needed is "the extensive vasodilatation produced by the direct action of the nitrite on the arterioles" to which Sollmann (21) refers. Inhalations of amyl nitrite will at once curb the danger, therefore, while injections of nitroglycerine will perpetuate its good effects. Here the action of the adrenal hormone is a byeffect which must be warded off. Late in the process of anesthesia, however, the opposite condition prevails, the heart fails because of exhaustion of the adrenals through excessive stimulation; here the injection of adrenalin is indicated.

Many other agents also include, among their effects, depression of the adrenals: choral, veratrum viride, aconite, etc. In strychnine poisoning amyl nitrite and other nitrites are also normal antidotes, in view of the action of the poison upon the adrenals, and, through these organs, upon the arterioles.

PHARMACOENDOCRINOLOGY OF PANCREAS AND NATURE'S WAY OF FIGHTING DISEASE.

Nature is economical in her methods. Although the defensive functions of the body are apparently very complex, they are in reality the opposite, for the destruction of bacteria, their toxins and other poisons in the body itself, is but a repetition of the process of digestion in the alimentary tract. They are, as first shown by Metchnikoff, Bordet, and others, digested by a trypsinlike enzyme in the phagocytes and plasma. Like the glycolytic enzyme first described by Lépine in 1889, it is an internal secretion of the pancreas to which, in cooperation with a splenic internal secretion, I attributed in 1903 (22) defensive functions. As to their presence in the tissues at large, Mendel, of Yale, states (23): "Enzymes are no longer thought of exclusively as agents of the digestive apparatus; they enter everywhere into the manifold activities of cells in almost every feature of metabolism." Abderhalden, in extensive researches begun in 1905, also states that "their presence has been demonstrated in animals and plants," and that "each cell of the body is capable of digestion." As is well known, he termed them "defensive ferments."

The advantage of this interpretation of the defensive process is not only its simplicity, but also the fact that while sustained by ample experimentation it is one which we can govern at will with our drugs, thus bringing it within the domain of pharmacoendocrinology. Especially is this the case in view of the fact that it brings into activity the functions of the thyroid body and of the adrenals previously described, besides those of the pancreas. Indeed, it also brings in the pituitary body, for time is steadily wearing down the secretory theory of this organ and proving by an increasing number of clinical and experimental facts the correctness of my conclusion in 1905 (24) that there exists a nerve path from the pituitary to the basal tissues, thence down the bulb and the cord through the cervical sympathetic and splanchnic to the thyroid body, adrenals, and kidneys. It is graphically shown in the frontispiece of the last nine editions of *Internal Secretions.* The pituitary body from my viewpoint is just as much the coordinating centre, the main or upper ganglion of the sympathetic system, which includes the secretory nerves to the ductless glands mentioned, as it was twenty years ago. An essential feature I wish to impress upon you in this connection, however, is that destruction or simple section of the basal tissues, through this nerve path from the pituitary passes, as I interpreted it in 1905, has been found by various experimenters to prevent the production of fever by any of its causes, and also the action of antipyretics. This cannot but emphasize the fact that it is through this path that the impulses to the defensive endocrins are transmitted.

Another feature of paramount importance which represents with the impulses through the nerve paths just referred to, the very crux ,as it were, of the defensive process, is the manner in which trypsin, the digestive enzyme, carries on its bactericidal and antitoxic functions. In any textbook of biochemistry you will see that the digestive activity of trypsin is raised by heat. In the laboratory, the proteolytic activity of the enzyme may be raised up to 104° F., when it begins to decline; but in the body this temperature is exceeded by several degrees. When, therefore, the body is to be defended against a pathogenic process capable of provoking a defensive reaction, i. e., fever (for many poisons and toxins fail to awaken it), it develops heat over and above that required by all functions under normal conditions.

Now, how is this heat generated? It is done by the other endocrines we have reviewed, when their activity is increased by impulses transmitted from their pituitary centre through their basospinal and sympathetic nerve path. The thyroid hormone secreted in excess, being rich in iodine, catalytically crowds oxygen (supplied by the concomitant excess of adrenal hormone produced) upon the phosphorus which all cells, particularly their nuclei, contain, thus generating heat in proportion as the defensive reaction is active. The trypsin then digests not only tissue and other wastes, but also the pathogenic agent or agents present. Hence the temperature rise which we term fever. Hence, also, the dangers of hyperpyrexia or excessive fever, i. e., above 105° F., for, in that case, the trypsin may exceed normal limits, and digest also some of the blood cells (hemolysis) and even delicate tissues (autolysis).

Turning now to the practical side of the question, you will find again that you have been practical pharmacoendocrinologists all along. Indeed, in giving a small dose of calomel, say one grain in divided doses, as a preliminary laxative, you always did more than you thought: Mercury in small doses is one of the most active stimulants of the endocrines we have. Again, when you applied the hot water bag to a painful area, you increased the defensive efficiency of the local trypsin, and caused active destruction of the pain causing wastes. It is upon this simple process that many apparently complicated but valuable methods of treatment depend, heliotherapy and light therapy among others.

And still greater methods belong to the endocrinological domain, for what are vaccines but prototypes of pathogenic toxins, which differ from those due to infection only in that they do not introduce into the body colonies of pathogenic organisms which develop sooner or later and flood it with toxins or endotoxins or both? Stimulated to vigorous activity varying with the specific activity of the vaccine used, the endocrines react correspondingly against the dangerous intruder and in turn flood the body with their defensive hormones, while acquiring through the experience greater reactive sensibility, which persists in a measure, in proportion as the initial reaction was vigorous. Another promising therapeutic method more recently introduced, nonspecific or foreign protein therapy, brings into activity the same defensive mechanism, hence belongs likewise to the field of endocrinology.

Pharmacoendocrinology, far from invalidating organotherapy, will aid in placing it on a rational basis by giving it the benefit of the pharmacological researches which drugs such as iodine or its salts, strychnine and its synergists, etc., that stimulate the endocrines directly, have revealed. It will also emphasize the value of organic products by indicating their absolute need to restore hormones, singly or unitedly (pluriglandular therapy) which through heredity or exhaustive diseases are insufficient in the tissues to sustain adequately the vital process and both the defensive and reconstructive functions. We may, for instance, stimulate the adrenals with strychnine after any severe infection has exhausted these organs, but if the pabula out of which their hormone is built are insufficient the drug will not add to the process of recovery. If, however, a suprarenal gland preparation is also given, convalescence will be greatly hastened. Particularly is this the case when the diet ordered includes oranges, grapefruit, tomatoes or other foods rich in antiscorbutin, the vitamine which in plants, from my viewpoint, is tyrosin, the biochemical homologue of adrenalin.

The process of elimination of wastes by the kidneys forms part of the endocrinological defensive mechanism. In 1908 a study of this question led me (25) to the following conclusion: "1. When the flow of urine is to be increased, the renal arterioles are dilated by vasodilator terminals of the sympathetic which reach the organ by way of the splanchnic nerves and the semilunar ganglia. The glomerular tufts being thus traversed by a greater volume of blood the components of urine are thus filtered out into Bowman's capsule. 2. When the flow of urine is to be decreased the same arterioles are reduced to their normal caliber by the vasoconstrictor filaments of the sympathetic which reach the kidneys also by way of the splanchnic nerves. 3. The adrenals and the kidneys are functionally united, the adrenals contributing by their secretion to the conversion of waste products into end products which the kidneys excrete with the urine." In a recent (1922) experimental study by A. N. Richards and O. H. Plant (26) in Philadelphia, these pharmacologists found that splanchnic stimulation, and also the use of adrenalin and pituitrin (which likewise gives the chromaphil adrenalin reaction) promoted diuresis by acting upon the arterioles of the glomeruli, the emission of urine increasing in proportion as these structures became filled through the increase of renal blood pressure. An editorial writer (27) rightly refers to this as epochal.

Permit me to urge upon you, and purely as a plea for the future, that many epochal discoveries would have been made in the United States during the last twenty years if endocrinology and the multitude of scientists who have thrown so much light upon its every subdivision, had been given their just due by the all science coordinative method I have pursued, instead of being throttled as they have been by the crude limitations of the day, which ignore the power of constructive reasoning. If this is done progress in the whole domain of medicine, by utilizing the immense store of knowledge untouched, unused, we already possess, will be so rapid and its superiority so radiant, that no human being will ever think of speaking of the accomplished physician otherwise than did Robert Louis Stevenson, who had learned through his many years of suffering, all that the term implies in power for good.

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The Internal Secretions in Their Relations to the Neurologist and Psychiatrist*

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I need hardly state that I share the views of Dr. Sajous in regard to therapeutic nihilism, and I do so in the most emphatic manner. For several decades therapeutic nihilism rested upon our profession like a blight. With few exceptions and for a long time—indeed for a period from which we are just emerging—medical students were taught very little concerning the action and uses of medicines. In many medical schools the subjects of materia medica and therapeutics were if not actually abolished at least relegated to positions of secondary importance and the actual teaching at times confined to persons who were not even physicians. Happily for the future this attitude is again changing and the importance of a knowledge of the action and uses of medicines is again coming to the fore.

Dr. Sajous has indeed given us a most interesting interpretation of the action of many remedies through the intermediary of the glands of internal secretion, a field which he was the first to explore, to interpret and to expound, and in which he has virtually acquired the rôle of superman. I am also convinced that he is right when he maintains that the problems are not as complicated as they seem and that they are all capable of an interpretation based upon principles which do justice to all branches of medical science, and further that they bear a most intimate relation to the questions of infection, intoxication, and immunity.

The matter which I am supposed to discuss is how the problem of the internal secretions affects the neurologist and the psychiatrist. A brief consideration convinces us that many cases of nervous and mental diseases present problems which are essentially those of disorders of metabolism. Many have to do with profound nutritional disturbances which have their origin in defensive reactions of the organism to intoxications. Such intoxications may arise from without or it may be from within the organism. Among the former are the various infections and intoxications of extraneous origin; among the latter are toxic states due to abnormalities of the various glands of internal secretion and of other hormone producing structures. Many of our cases, too, have to do with aberrancies and arrests of development or with peculiarities of structure and organization often hereditary. We should remember especially that when we are dealing with patients suffering from the neuroses and mental affections generally, we are dealing with individuals who are organically defective. This is what the words really imply when we speak of a patient as neurotic or as neuropathic. The neuroses, for example, psychasthenia, hysteria, and hypochondria, present not only in the history of heredity but also frequently upon the very person of the patient, the evidences of an imperfect or a deviate development. In their symptoms likewise, the neuroses present in turn deficiencies and deviations which give to each its basic character and which in each are innate and developmental.

Space will not permit of more than a cursory allusion to the biological facts which underlie the truth of these statements. Two important facts especially present themselves. Each gland of internal secretion consists first of a specific epithelium, and secondly of an interstitial tissue which last has the apparent value of a supporting tissue and which is closely related to the generalized lymphoid tissue of the embryo. These two elements have a markedly different biological value, so to speak. The specific epithelium is a highly differentiated structure, one highly specialized and probably produced at a relatively high cost to the embryo, while the supporting tissue generalized in character is a much cheaper product biologically speaking. It is therefore not difficult to understand that an organism in whom the power of development and growth has been enfeebled should present abnormalities of the glands of internal secretion. Sometimes the clinical pictures are generalized in character; sometimes they point to the involvement of a special gland or glands.

A generalized picture is presented largely in the socalled status thymicolymphaticus. Here it would appear that the more expensive epithelial structures had been developed insufficiently or inadequately and that there had been a corresponding excess of the relatively cheaper lymphatic or connective tissue. In fact, the status thymicolymphaticus is characterized by a persistent thymus gland and a general lymphatic hyperplasia. In keeping with these facts we find numerous morphological anomalies. Prominent among these are stigmata of arrest and deviation of development affecting almost all of the organs and tissues. Such anomalies are present, of course, in varying degree, sometimes very slight and sometimes marked but always significant. That the nervous and mental symptoms should share in the general biological inferiority can be largely understood. Thus we may have in the more pronounced cases idiocy, in others mental infantilism, or it may be, socalled constitutional inferiority; in others again a feebleness of structure such as leads later on to a dementia præcox; or, on the other hand, in the milder cases to those aberrancies of the reaction of the organism which give rise to the neuroses, more especially to hysteria, psychasthenia and hypochondria. Personally I am convinced that we commonly overlook enlargement and persistence of the thymus gland. It ought to be far more frequently studied. Now and then we make a discovery, for instance, its persistence in diseases of morphological origin, such as multiple cerebrospinal sclerosis.

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*Part of symposium on modern therapeutics read before the Philadelphia County Medical Society, June 14th, 1922.

Instead of generalized disease pictures such as these, we may have instead, as just stated, symptom groups due to the involvement of special glands. These pictures are all well known to you. I need but enumerate them; there are the hyperthyroidism and hypothyroidism so often met with in the neuroses; then the graver forms of thyroid disturbance seen in exophthalmic goitre and in myxedema; the mixed form of thyroid and pituitary disturbance seen in adiposis dolorosa and other forms of adiposity. In exophthalmic goitre, Graves's disease, there is, by the way, quite commonly also an enlarged thymus gland, a fact not generally recognized. Then we have the disturbances of the pituitary seen in acromegaly and in dystrophia adiposogenitalis and in the disturbances of carbohydrate metabolism; then the train of affections dependent upon disease of the medulla of the adrenals on the one hand and of the adrenal cortex on the other; not to speak of the disturbances of the sex glands. One of the facts that impresses us when we study these special clinical pictures is that no given affection can be narrowed down to one gland but that they all present symptoms which can only be explained by the involvement of several glands. In other words, they are in a degree all more or less pluriglandular.

With these general facts before us what shall be our attitude as regards treatment? Evidently in the graver forms in which gross or marked failure of development is present such as in idiocy, imbecility, constitutional inferiority and very frequently in dementia præcox, the facts set an abrupt barrier to our attempts at therapeutics. Not so, however, in the milder forms such as we meet with in the neuroses. Bearing in mind the basic facts of the biological feebleness of the organism, forced nutrition and rest such as is practised in systematic rest cure methods assume here a specially important rôle. Sometimes, too, when the underlying condition consists of a larvated status thymicolymphaticus the change that can be brought about by small doses of thyroid administration is truly amazing. Similar remarks apply to hypothyroidism and myxedema and to a lesser extent to hyperthyroidism and exophthalmic goitre. Slight disturbances of the thyroid gland, it may be remarked in passing, should be especially sought for in cases of socalled psychasthenia. In regard to thyroid administration an important point to bear in mind is that often more is accomplished by small doses continued for a long time than large doses for a short time. Besides, such a method is much safer as the action of the thyroid substance is often cumulative. Finally, I myself prefer the desiccated gland to the extracts or to thyroxin which I have not yet ventured to use.

Space will not permit of a consideration of pituitrin, adrenalin, spermin and other glandular preparations. Suffice it to say that the well known properties of each are a sufficient indication for their use. Quite commonly I believe it wise to resort to a pluriglandular therapy. In this connection we should bear in mind especially the persistent administration of small doses of thyroid extract to stimulate the general tissue metabolism. Not infrequently this method results in stimulating the entire chain of glands of internal secretion. It is important, however, to remember in combining the various glandular preparations, the relations which have been developed between the various glands. The latter have arranged themselves, so to speak, into two groups, the members of one of which act synergically or in harmony with each other, but are in antagonism with the members of the other group; thus, the thymus gland is in harmony with or reinforced by the thyroid, the pituitary, the cortex of the adrenals and perhaps the parathyroids; on the other hand the thymus is antagonized by the medulla of the adrenals—the chromaffin system—and by the sex glands. It would be unscientific, therefore, to combine any two or more of the glands belonging to antagonistic groups. Finally, as regards the entire matter of endocrine therapy we should bear in mind that save in given instances we should not expect too much. The glandular failure which calls forth the symptoms of a given case is always biological and this fact necessarily often and very early fixes a limit to what we are able to accomplish.

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Primary Sterility*

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I shall try to present in a condensed form my impressions and experiences gained during a period of twenty years of active clinical work in the treatment of primary and relative sterility, and at the same time give a detailed analysis of four hundred cases seen at my office from August 1, 1919, to August 1, 1921.

For some reason the subject of sterility has always appealed to us, not because it is interesting from a medical and social aspect, but because of the tremendous sacrifice the average woman is willing to make in order to obtain a cure. Such a mental attitude of necessity has its dangers, so that not infrequently these patients become an easy prey to the quack and charlatan, both within and without the domain of the organized medical profession. Medicine is not an exact science, and therefore lends itself to all sorts of cults, which promise and profess to cure every human ill. I feel that the time has come for those of us, who are seeking the truth, to check up our results as to what we have accomplished in the treatment of sterility, and not allow ourselves to be deluded by an occasional cure, which to my mind is often purely accidental or incidental, as I shall point out later.

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It may be that a larger experience has a tendency to develop an undue amount of pessimism; yet I cannot refrain from saying that, if I were asked how many sterility patients I have actually cured by any known method of treatment which I have employed, I would have to confess that the numbers are few. The reason for this, I believe, is that our entire conception of the etiology and treatment of primary as well as relative sterility is entirely erroneous; furthermore, that in many instances our present methods of treatment tend to induce permanent sterility. It is indeed surprising that we have not realized long ago that there is still a wide gap between what we actually know on the subject and what, as yet, is still an unexplored field, and how much we must still learn in order to interpret intelligently the causes of sterility in the largest number of cases.

From the pioneers in the field of gynecology in every country the medical profession received a heritage concerning the etiology of sterility, which, I feel, produced more harm than good. For some reason the mechanical theories of sterility, as propounded by the earliest gynecologists, are still given support, not only by the profession at large but also by the specialists, and they are even taught in our medical schools. Such teaching, when followed in actual practice, results in operations upon the cervix which vary from simple dilatation and curettage to the many cutting operations that have been invented from time to time. That this is so, is proved by the fact that in nearly seventy-five per cent. of the cases under consideration, the patients have had from one to six operations performed for the cure of sterility, and they still remain sterile. Even during the last two years at least four comprehensive papers have been published by prominent gynecologists, who are associated with well established hospitals, dealing in a statistical manner with the results obtained by the various operations upon the cervix. It seems to me that we all must realize that such statistics are valueless, for no matter how astute one may be in his diagnosis of pelvic conditions, still he cannot always determine the true pathology of the fallopian tubes. We know that often the inflammatory reaction in and about the tubes is slight and insidious, but nevertheless is sufficient to cause their closure; that this is true in nearly thirty per cent. of cases, we can now definitely prove. Therefore all statistics dealing with the results obtained from cervical operations for sterility are not only incorrect but are scientifically not true.

Before we really began to realize that the mechanical theory of sterility was wrongly conceived, a new and, for the time being, a very promising and almost fascinating discovery was "sprung" on the profession. The organs of internal secretion were heralded both as the builders and destroyers of the human body; were held responsible for all the ills that human flesh is heir to. The literature abounded with miraculous cures of all sorts; enthusiastic reports from most responsible sources accumulated so rapidly, that one found it most difficult to keep pace with all that was written on the subject. It really appeared as if organotherapy was going to change, if not revolutionize, the few fundamental principles of the science of medicine which took so many years of patient investigation to establish.

The result was that every sterile woman was given all sorts of combinations of organic extracts. Specialists of high repute vouched for the efficacy of the treatment, and anyone who doubted their reports was accused of ignorance; he was told that he was not capable of diagnosing and classifying the patients into their proper groups, and therefore "missed the mark." Some even kept this valuable knowledge to themselves and wrote prescriptions, which could be deciphered only by their own particular druggist. Their behavior was such that it almost led one to believe that they were the recipients of divine inspiration, and therefore the ordinary mortal was incapable of interpreting the various manifestations, which were supposed to be associated with dysfunction of the various glands of internal secretion.

Nevertheless, all of us honestly gave these new remedies a fair trial, but most of us very soon discovered that they were falling short of the claims made for them, and notwithstanding our treatment, a large proportion of our sterile patients still remained sterile. I feel that if we blindly accept the theory that the organs of internal secretion are primarily responsible for sterility, we will again be led astray for another thirty years, and in the meantime our attention will be detracted from the true causes of sterility in the largest number of women.

During the past decade, men's share of responsibility for sterility has, in my experience, undergone a great change. In a paper published by me in 1911, I found that the man was at fault in nearly thirty per cent. of cases, and this coincided with the experience of a number of observers at that time. In this series it is less than eleven per cent. I believe that the educational campaigns conducted by the medical profession and the various public health agencies are just now beginning to bear fruit. Every intelligent young man has been practically frightened into the practice of continence before marriage, and the result is that gonorrhea, with all its complications, is on the decrease.

In all of our cases the male aspect was thoroughly investigated, either by me or by Dr. S. S. Rosenfeld, who is associated with me in this work, or by a competent urologist.

In a great number of cases our search extended further than the routine condom specimen examination. We tested the spermatozoa with various mild acid and alkaline fluids; we carefully watched how long they survived; we tested and made cultures of both the vaginal and cervical secretions; we took vaginal smears and cervical smears, and in a number of cases did the gonorrhea complement fixation test; we collected the spermatozoa from the vagina and cervix at periods ranging from half an hour to several hours after coitus.

While these examinations may be interesting from an academic viewpoint, I am certain that, as far as our experience is concerned, they have no practical value. The mere fact that dead spermatozoa are found in the cervix or uterus one or two hours after coitus does not signify that all the spermatozoa died before they reached their proper destination. Nature is very abundant in the supply of spermatozoa and not all possess the same degree of viability. Under the microscope it can be readily seen that the spermatozoa vary in size, shape, and mobility. Even under the microscope some are seen to die early, while others survive a longer period of time. The same, practically, takes place when the spermatozoa reach the uterine cavity; the stronger ones keep on travelling and very soon are beyond reach, while the weaker ones will die in the vagina, in the cervical canal, or at a point higher up in the uterus. It seems to me that we know very little of the relationship which exists between copulation and ovulation, and so far, all that has been written concerning it in the human race is highly speculative.

In the light of our present knowledge, we must pronounce the men well if the examination of a condom specimen shows fully formed and viable spermatozoa. That this is so, has been fully proved to us in the many instances of second marriage on the part of the husband, who had children with his first wife and none with his second, and also by the number of cases where the man impregnated a woman before marriage.

A number of our patients were inseminated; the semen was lodged high in the uterine cavity; we thought that we might help ovulation in that way. Not one of these patients became pregnant. The failure of conception to take place in these cases seems to indicate that something is wrong somewhere "higher up," and I am sure that if the problem of sterility is to be solved at all, it will have to be investigated from a purely biological and chemical viewpoint.

A great number of women who are sterile have practically the same developmental characteristics; they are short, fat, stocky, and give a history of menstruating very irregularly. We thought that in some of the patients we could possibly detect some anatomical defects in the bony pelvis and therefore had their pelves x rayed, with the hope that some of the cases would show a spina bifida occulta, which would indicate that at some stage of the development of the individual something had gone wrong. Unfortunately the findings were negative and we had to abandon this form of examination.

We then selected a group of women and their husbands for the purpose of having their blood typed, in the hope that the examination would show a characteristic grouping, but we found no material difference in the grouping between the sterile couples and those who had one or more children.

A great many women who suffer from sterility gain in weight rapidly. Thinking that possibly there was some direct relation between lack of fertility and the rapid deposit of fat, we accordingly restricted the diet of these women to proteids, green vegetables, and fruits, and absolutely eliminated sugar and starch and, although having succeeded in some instances in reducing their weight as much as forty-five pounds, still, not only have these women failed to become pregnant, but it had no apparent effect upon their menstrual histories. I am sure that diet has no direct relation to sterility.

In our study of the individual patient who consults us for sterility we are likely to find a few clinical signs which will indicate that something took place during adolescence disturbing not only the cycle of menstruation but also its character. Some change had evidently taken place in the entire regenerative tract, and it is my experience that those patients who give a history of having developed sudden and severe pain during the second or third day of their menstruation three or four years after puberty, are more likely to be permanently sterile.

In order to find out whether there is any possible relationship between the exanthematous diseases and sterility, I carefully inquired from all my patients regarding the diseases of childhood and infancy they had passed through; also whether they were mild or severe; and it is my impression that there is a greater prevalance of sterility among the women, who during their infancy or childhood had troublesome throat infections, and also that women, who have had scarlet fever complicated by severe kidney disturbances, are not so likely to be sterile as those women who had simple, noncomplicated scarlet fever. While this is highly speculative, still I feel that something might have taken place during an attack of scarlet fever or diphtheria, which prevented the ovary from properly developing and possibly at the same time caused permanent structural changes.

In the year 1919, when glandular therapy practically reached its height and brilliant results of the treatment of sterility by these organic extracts were reported everywhere, I decided to find out what the experience of others had been. At a meeting of the American Association of Gynecologists and Obstetricians, held that year, I decided to ask about a dozen of the more prominent members of the association as to the results obtained by them with the various methods of treating sterility. I was really astonished to find that the majority of them had nothing new to offer, while one or two showed great enthusiasm for organic therapy. However, it took a wise old man, the late Dr. Carstens of Detroit, really to display the broadest conception of the entire subject of sterility, for he said to me: "Treat them or don't treat them; some will get pregnant and some will never get pregnant."

On my return from the meeting I decided to make a careful study of all the cases of primary sterility which might come under my observation, and to examine each and every patient as thoroughly as possible; also to analyze carefully the patients from an endocrinological viewpoint. I tried to classify my patients into the various types, as formulated by some of the best students of endocrinology. We are told that by studying the endocrine traits of physique, life reactions, disease tendencies, and hereditary history, one may gain an insight into the composition or constitution of the individual; moreover, the endocrine type of an individual is a summary of his behavior in the past and is also a prediction of his reaction in the future.

It seems to me that, as yet, the endocrine label is but roughly qualitative and most crudely quantitative. This analysis, however, brought forth one interesting fact, namely, that in answer to the question, "Whom do you resemble, father or mother?" 221 patients said that in physique and features they resembled their father, and eighty-five patients stated that they resembled their mother. While this may be purely accidental in this series of cases, nevertheless it may have some bearing from a biological viewpoint.

When I became convinced that our treatment of sterility was of no avail in a large proportion of cases, I decided to select a number of women who upon examination showed no evidence of inflammatory changes in the pelvis and to give them no treatment whatsoever, except a placebo from time to time. All of them were married a year or longer. It was really surprising to find that of thirty-six patients so managed six became pregnant, of whom four were delivered of full term babies. This, to my mind, is the best illustration that sterility is very often temporary in nature and that in a certain number of women some readjustment takes place and pregnancy ensues.

Before we enter upon a detailed discussion of our series of cases, I believe it is necessary to establish the time when a marriage should be considered sterile. The older authors considered a marriage sterile when pregnancy did not ensue one year later. However, as a result of changed economic conditions, a great many newly wedded couples do not desire or on the contrary prevent conception during the first year of married life; therefore it is necessary to prolong the time when a marriage should be considered sterile. I believe that no marriage should be considered sterile before two years have passed.

As it is not the purpose of this paper to bring forth a method of treatment for the cure of sterility, but to prove that the many operations performed on these patients were absolutely useless and at times not indicated, I shall not enter into a discussion of the age and social history of the patients, and shall omit the findings elicited by vaginal examination, such as displacement of the cervix and uterus. I cannot help feeling that it plays a very small rôle in the etiology of sterility. The only findings which are more or less important are, first, the small, infantile body of the uterus, that is, narrow from side to side, is associated usually with a small conical cervix and is frequently found in the women who are fair, somewhat stout, and who give an irregular menstrual history; second, the large, hard body of the uterus with a long hypertrophied cervix and a history of rather profuse menstruation, which is usually found in the tall dark, masculine type of woman.

To me, such findings indicate a most unfavorable prognosis, and no matter what one may do for these patients the results are unfavorable. I am sure that if they were left alone some of them would have a better chance to become pregnant, for the various operations performed on them often result in the closure of the fallopian tubes, causing permanent sterility.

Patients, in whom we find a small, cordlike body of the uterus, retroverted and often adherent posteriorly, must be left severely alone, for I never saw one of these patients become pregnant, whether they were treated or not. Plastic operations on the fallopian tubes, in my experience, hold out very little hope for the cure of sterility. In this series twelve women had been operated upon by me for chronic salpingitis because of their sterility; only one became pregnant. Twenty-eight women consulted me after they had had plastic operations by seventeen different operators for the relief of sterility. In my entire obstetrical practice, I delivered only two women who had had plastic operations on the tubes for the cure of sterility; six of my patients were insufflated subsequent to their operations and in all we found the tubes closed.

It seems to me that those patients whose tubes became closed because of gonorrheal infection often have a better chance if they are not operated upon, for such exudates in time may be absorbed and the tube will become patent. The reaction which follows an operation, if it becomes organized, is less likely to be absorbed and therefore the tubes will remain permanently closed; however, in the future it may be possible to overcome the closure of the tubes by having these patients insufflated during their convalescence at regular intervals, either every second or third day, and in that way we may prevent closure of the tubal openings.

Twenty of the patients suffered from fibroid tumors of the uterus. The tumors in this class of patients are usually small and give no symptoms. They are only accidentally discovered when the patient inquires as to the cause of her sterility. To my mind, it is still a mooted question, whether to operate on these patients. I removed the fibroid tumors in nine patients; one became pregnant and was delivered of a normal child and another became pregnant and miscarried at the end of the third month; the others are still sterile.

One of the dangers of suggesting operative intervention in this class of patients is that on opening the abdomen one may find it impossible to perform a myomectomy, for the findings may be such that a complete hysterectomy will have to be performed. This is certainly undesirable in young women who never conceived, although I was compelled to do so in three patients. Myomectomy, also, is not free from danger, so far as the disturbance of the continuity of the genital canal is concerned, especially if the tumors are deepseated, causing enlargement and distortion of the uterine cavity. That this may happen was recently demonstrated, when I attempted to insufflate two patients who had had uterine tumors removed; in both patients the tubes were found to be closed.

Since then I never render an opinion to a patient who is sterile and is also suffering from a fibroid tumor of the uterus, unless she is insufflated first. If I find the tubes open I do not advise operative intervention unless acute symptoms develop, for it is a wellknown clinical fact that women who suffer from fibroid tumors of the uterus are more likely to become pregnant between the ages of thirty and forty than they are between the ages of twenty and thirty, and something may be gained by waiting. However, if I find the tubes closed I advise operation, for there is nothing to be gained by delay.

Fifty-two patients have had dilatation of the cervix and the insertion of a stem pessary for the purpose of correcting and enlarging the cervical canal. In some instances the patients carried the pessaries for as long as three months. Eight of these patients became pregnant, one while the pessary was still in the cervix; the others remained sterile. It seems to me that the stem pessary operation is a relic handed down to us by the older gynecologists, who thought that they could permanently enlarge the cervical canal by keeping a stem pessary in it for a longer or shorter period of time. I never saw a permanent enlargement of the cervical canal after a stem pessary operation, for no sooner was the pessary removed than the cervical canal contracted and assumed its former size. Often a stem pessary operation will act as an irritant, and in patients suffering from chronic inflammation about the pelvis an acute exercerbation of the symptoms may occur and serious complications result. Such cases have been observed by every gynecologist of large experience. Furthermore, the stem pessary seldom relieves the painful menstruation from which the patient usually suffers; if there is a definite mechanical obstruction at the internal os, a stem pessary never corrects it. Such patients require a correction of the flexion and this can only be accomplished by one of the cutting operations on the cervix.

Eight patients in this series had unilateral ovarian cysts. The tumors were removed; the other ovary in each case was enlarged and cystic. The menstrual history in these patients remained unchanged, and they all remained sterile.

Three patients had dermoid cysts of the ovary; in one patient it was bilateral. This patient was thirty years old, married six years, and never pregnant. On opening the abdomen, a right infected dermoid cyst was found and removed; a small dermoid cyst of the left ovary was also found. The cyst was carefully dissected and a small, thinned out portion of the ovary was left. The abdomen was closed without drainage. This patient became pregnant four months later, and was delivered of a full term child. I believe that ovarian tumors in women who are sterile should be removed as soon as possible, because the tumor may act as an irritant to the other ovary; also because these patients may have a large cyst of one ovary and a small cyst of the other ovary, and by an early operation we may be able to save a small portion of the ovary, which is less involved and has not, as yet, been destroyed.

Eighteen patients had double pyosalpinx; the clinical diagnosis was verified by the operative findings. Four patients suffered from congenital lack of development of the genital tract. In one patient an artificial vagina was constructed for marital reasons. Three patients suffered from persistent vaginismus; the classical Pozzi operation was performed and they became pregnant shortly after. Three patients had cervical polypi which practically occupied the entire cervical canal. Such patients usually suffer from fibrosis uteri, and even if the polypi are removed they still remain sterile. Five patients were operated upon for appendiceal abscesses prior to their marriage. The abdominal wound was drained; evidently the infection extended to the pelvis, involving the tubes and causing their closure.

The real problem that confronts us in the treatment of sterility is within that group of patients which practically presents no anomaly in the genital tract, except possibly a moderate degree of flexion or version. For the want of a better term, we classify them under the heading of functional sterility. That there is some disturbance in the physiological processes in a great number of these patients is shown by the fact that many of these patients practically suffer from sexual anesthesia, which must not be considered normal, notwithstanding the views held by many to the contrary. These patients also give a history of sudden changes in their menstrual history; usually the flow becomes less regular and scantier in amount. We do not know at present what the underlying factors are which cause the disturbance in the physiology or chemistry in such patients. It is in this class of patients that we allow ourselves to be carried away by highly theoretical speculations as to the cause of their sterility.

One of the greatest advances in gynecology, and especially in the diagnosis of sterility, has been made by Rubin. He certainly added a new chapter to gynecology when he conceived a method by which it was possible to ascertain the patency of the fallopian tubes, thus practically changing the entire status of sterility and its treatment. We are now able for all practical purposes to classify all patients who suffer from primary as well as relative sterility into two general groups: 1. The socalled clean group, or patients who suffer from sterility due to some constitutional disturbance; 2, the unclean group, or those who have or still are suffering from an inflammatory condition in or about the pelvis.

This method of examination will also help us to put a proper valuation on the results of the plastic operations on the tubes for the cure of sterility. By this method of examination we shall be able to tell whether the tubes are patent or not, and if they remain patent we shall know that the sterility is caused by some other disturbance.

In December of last year, after familiarizing ourselves with the work of Rubin, we instituted this method of examination at the Lebanon Hospital. Our cases were carefully selected and thoroughly examined before they were subjected to this examination. During the past twelve months we made 152 examinations. I shall not describe the technic, for at this time it is fairly well known to every one who is interested in the subject, except to state that it must be carried out under the most aseptic precautions, that the vagina and cervix must be carefully cleansed, that the rise of the mercury in the manometer must be carefully watched, and that the gas must be allowed to pass very slowly so that it takes about fifteen seconds for the column of mercury to rise from zero to 100 mm. The amount of gas consumed is determined by the reading of the siphonometer, which is incorporated in the apparatus; every bubble of air represents thirty-seven c.c. of gas.

In our series of cases the average rise in the patent cases was 132 mm. and 182 mm. in the closed cases. If oxygen is used, not more than 300 c.c. should be introduced, since oxygen is slowly absorbed and therefore is likely to produce pressure symptoms in the right upper quadrant of the abdomen, causing pain in the right shoulder. When carbon dioxide is employed, a greater quantity can be used, because of the rapidity with which it is absorbed.

The patient is then fluoroscoped in the erect posture, in order to see whether gas is present in the abdominal cavity. Usually gas is found in the upper right quadrant under the diaphragm, separating it from the liver; a smaller quantity is also visible in the left subphrenic space. With increased experience one is usually able to foretell by the manometer reading, studying the fall and rise of the mercury column, whether the tubes are patent or not. However, in order to establish a positive diagnosis the fluoroscope must be employed. We have had instances where the mercury rose to comparatively low levels; nevertheless the fluoroscope failed to reveal the presence of any gas, and vice versa, we have had cases where the mercury rose over 200 mm., with little fall, and yet the fluoroscope showed the presence of gas. We do not allow the pressure to rise above 220 mm. of mercury; however, on two occasions the mercury rose to 250 and 260, respectively, without any complications.

In patients in whom the tubes are closed, the gas will usually escape through the cervix after overdistention of the uterine cavity has taken place. In doubtful and negative cases it seems to us that it would be a good rule to have the patient reexamined a second and even a third time, in order to establish definitely the diagnosis in patients in whom the first examination proved negative. We believe that it is possible for the gas either to dislodge or pass by the mucogelatinous substances, which often clog the tubes, and at times it will even overcome a kinking of the tubes. This may be the reason why in many of the patients the mercury column rises very high before the initial fall takes place. In our series of cases, ninety or fifty-nine and two tenths per cent. were positive, i. e., air present in the abdominal cavity; sixty-two or forty and eight tenths per cent. were negative, or no air present in the abdominal cavity.

As a general proposition, it may be stated that, whenever the air passes into the abdominal cavity through the tubes, they may be considered patent from the viewpoint of mechanical obstruction to the passage of the travelling spermatozoa. However, recently while operating on two patients I found the tubes filled with a mucogelatinous mass and somewhat thickened at the outer third. And in order to ascertain whether the tubes were patent, I asked Dr. Rosenfeld to insufflate the patients. The initial rise was very high, and finally the gas began to bubble through the tubes and pass into the peritoneal cavity. In the second patient, whom I had operated upon for chronic left salpingitis, I found the tube on the right side somewhat thickened and enlarged, and in order to ascertain whether it was patent, she was also insufflated while the abdomen was open. In this patient I found that under pressure the gas caused distention of the tube and it finally escaped into the peritoneal cavity.

These two patients illustrated this fact: that while the fallopian tubes may be plugged by some inflammatory exudate or some mucogelatinous substance and still permit the passage of gas under pressure, yet, without artificial distention of the tubes the plugging may act as a barrier to the passage of spermatozoa. In other words, the mere fact that gas passes through the tubes does not mean that the tubes may not be kinked or blocked to the passage of spermatozoa. Further experience will be necessary to establish this important point.

The contraindications to this method of examination are acute infections of the vagina or pelvic organs; the danger of spreading infections under such conditions is obvious. Also, it must not be used in the presence of chronic infections, if the patient complains of pain; in such cases it is best to defer examination until the pain has subsided. It should not be performed when the menstrual period is about to appear. Patients who have heart disease, especially when myocardial changes are suspected, should not be subjected to this examination, because the pressure of the gas, by raising the diaphragm, may seriously embarrass the heart action.

In our series of cases the complications we had were as follows: 1. Severe syncope in a patient who was quite obese; apparently, as soon as the gas lifted the diaphragm, the heart action was interfered with, the patient became cyanosed, and the pulse barely perceptible. However, she rapidly rallied and we were able to continue with the fluoroscopic examination. 2. The same complications to a lesser degree in another patient. 3. In a patient who had previously been operated upon for acute appendicitis and later for intestinal obstruction, and who had adhesions in the left pelvic region, we evidently caused sufficient irritation by our manipulations to cause acute inflammation in the left fornix, which lasted about two weeks and subsided under palliative treatment. Ordinarily patients will complain of pain in the right side of the abdomen and right shoulder, lasting anywhere from twelve to forty-eight hours when oxygen is used. However, if carbon dioxide is used, the pain is of short duration.

A close study of this procedure convinces us that this method of examination should be utilized in every case in which the sterility is of doubtful origin. It is important that the patency of the tubes should be established before any other form of treatment is undertaken. It is especially useful in patients who have had a unilateral infection of the fallopian tubes, or in those who have had one tube removed because of infection or extrauterine pregnancy. Heretofore we have had no means by which we could ascertain the patency of the other tube, except by operation. Our conclusions in such cases were usually that the other tube was also involved, but that the involvment was not sufficiently great to be detected by the examining finger, and therefore many of these patients were advised to undergo plastic operations on the remaining tube in order to cure their sterility.

Four of our patients did not menstruate after they were insufflated, and upon examination were found to be pregnant. One of these patients, who was since delivered of a living child, had been operated upon for left tuboovarian disease seven years previously. She consulted us about her sterility and before I advised any definite plan of treatment, I had her insufflated and found that the gas passed into the abdominal cavity after the pressure rose to nearly 200 c.c.

The second patient had been married eight years, and had never been pregnant. She had an irregular menstrual history, and during the past year had been spotting and staining irregularly for nine months.

All known therapeutic agents, including various combinations of organic extracts, were given her, but she was not relieved. Finally radium was applied and the bleeding subsided. Shortly after she consulted me about her sterility, and after our examination for the patency of the tubes, she never menstruated again. On December 1st, I found her three months pregnant.

The third patient was a woman, who had been operated upon for extrauterine pregnancy nine years ago and since then had never been pregnant again. After the transuterine insufflation examination menstruation did not reappear, and upon examination about seven weeks later, I found her to be pregnant. She carried to the end of the third month, when she miscarried. The fourth patient was a woman, who had been sterile for six years, and became pregnant after she had been insufflated.

We do not believe that the occurrence of pregnancy in these patients was purely accidental. We feel that the force of the gas either expelled some mucous plugs from the tubes, or straightened out some kinking which might have taken place along their course. Therefore this method of examination is valuable not only from the viewpoint of diagnosis, but we are sure that in the future it will prove to be of great therapeutic value in some cases.

We cannot see the reasonableness of those who do not adopt this method of examination, for we feel that a sufficiently great number of cases have at this time been examined by a number of investigators to prove that the dangers and complications associated with it can be eliminated, if the cases are properly selected. We are certain that in a short time this method of examination will become a routine in our office practice, and that no patient will be given a definite opinion as to the cause of her sterility before the patency of the tubes has been established.

In conclusion I wish to state that the treatment of sterility consists chiefly in the art of being able to select the patients, who are likely to respond to treatment; that those patients, in whom we find congenitally defective organs, ought to be let alone and told that time is a great factor in the cure of sterility, and that as far as the science of medicine is concerned we have very little at our command which would enable us to cure them.

I fully realize that it requires a great deal of experience to be able to differentiate and choose our patients from the viewpoint of prognosis, for not infrequently pregnancy will take place in patients in whom we thought it impossible to occur. However, on the whole, there seems to be a group of patients suffering from sterility who are hopelessly incurable and remain sterile for the rest of their lives, and still wander from doctor to doctor in the hope of obtaining a cure. The hope held out to such patients by physicians has a tendency to create a suspicion in the minds of those women as to the integrity and honesty of the medical profession. We must learn to discriminate and select only those patients for treatment whom we think we can cure.

345 West 88th Street.

Acute Osteomyelitis*

By FRANK LeMOYNE HUPP, M. D.,
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The subject of acute osteomyelitis is manifestly a large one and its presentation needs no apology when one reflects that many of us are not fully alive to our responsibility when it comes to early recognition with prompt and correct surgical relief. You may find no new concept in this paper, but you may recognize some older and well known ideas clothed anew and reemphasized, as they have been gathered from the hospital ward and at the operating table.

Under the name of endosteitis, or osteomyelitis, that great savant in surgery, Samuel D. Gross, in 1859, described a disease of the medullary membrane, possessing all of the characters of a true inflammation. Its cause was said to be of traumatic origin, the result of cold or some constitutional taint. As Foster Kennedy observes: "When these were beginning to be solved, little or nothing was known of infections, bacteriology was still unborn, and to explain morbid processes men were oriented toward innate degeneration and deficiency of vital forces, rather than to guerrilla warfare, which we now know to be waged unceasingly in our bodies between cells and humors on the one hand and an implacable host of microscopic and ultramicroscopic organisms on the other."

James P. Warbasse read a paper on this subject before the Medical Society of the County of Kings in February, 1915, in which he spoke of how the surgeon had been scolding the physician for tardiness in recognition and delay in referring for operative treatment such diseases as appendicitis, ulcer of the stomach and duodenum, tuberculosis of the kidney, cancer of the gastrointestinal tract, perforating typhoid ulcer, ectopic gestation, and many other emergencies easily recognized. Rarely do we find any mention of acute bone infection, a disease which, from its very inception, has been a vital surgical problem.

If one would take the trouble to look over the programs of the section in surgery of the American Medical Association for the past twenty-five years, he will find little bearing on the physicians' responsibility in acute osteomyelitis. Some of the older members of the society will remember with interest, and perhaps some amusement as well, the animated discussions coming annually with these meetings, the chief participants being Joseph Price, Deaver, Morris, Ochsner, Richardson, and Murphy. How the appendix was characterized as the greatest character artist of the abdomen, and how we were admonished to beware of appendicular duplicity and always brand this useless death trap as guilty, until it could definitely establish its innocence.

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*Read before the West Virginia State Medical Association, May 18, 1922.

For many years the field was given over to the acute abdomen, but the tables have turned and bone pathology, by reason of its frequency and neglect, has demanded recognition. True it is, as Warbasse has written, that osteomyelitis is in a class by itself, a disease wholly surgical, and the medical man must know the symptoms, recognize them without delay, and join hands with the surgeon for immediate and correct operative relief.

He is to know that there is no middle ground, no mediation, and fully appreciate that the neglect of this obligation means profound invalidism, the fate of the limb or of life itself. The doctor who will attempt to treat palliatively or medically these acute bone infections, is just as culpable as one who will attempt to use cold storage, physic, or the watchful waiting policy in an acute appendicitis, or who will dillydally with an operable cancer until the life of the patient is beyond reach.

Just as the bacteria are brought to the bone by the blood stream, so may a general infection be said to exist before the osteomyelitis begins. We should know definitely that without surgery it is a serious disease even in its mildest form, and with surgery it is hopeful in its worse stages (Warbasse). There is scarcely any other well known and frequently seen disease in our hospitals today with respect to which there have been so many sins of omission and commission.

With regard to the etiology, we know that a tooth containing a visible pathological change, or an invisible pathological process revealed only by the x ray, such as pyorrhœa alveolaris or periapical granulomata, a tonsil harboring an abscess, an accessory sinus of the head which acts as host to a colony of microorganisms, may be definitely indicted as potential etiological factors in acute bone infection.

Metastatic infections secondary to typhoid fever or pneumonia, and those associated with trauma, especially following fractures of long bones, have from time immemorial been recognized as contributing to the cause of this disease.

It is not within the scope of this paper to deal with the genesis of the osteoblast, or to dwell upon the behavior and potency of this little mesoblastic cell, commonly acknowledged to be the dominant factor in bone regeneration (Colvin). In passing, we only wish to point out, with Macewen, how within a few hours of the onset of the acute symptoms of a virulent osteomyelitis, "the induction of pyogenesis in the medullary canal is followed by an enormous osteoblastic proliferation in the bone tissues, which is rapidly extruded onto the surface, filling the areolar meshes, where the osteoblasts ultimately form osseous plaques and become adherent to the periosteum." The infection spreads with great rapidity beneath the periosteum dissecting loose this fibrous membrane, and only limited at either extremity by the epiphyseal plates.

The recognition of the behavior of these bone producing cells is of the greatest importance, particularly bearing on a correct interpretation of the complex pathology as seen in the radiographer's laboratory. Those who are familiar with the work of Macewen will recall how experiments demonstrated the osteogenetic potency of the osteoblast, the independent vitality and proliferative power, both within the diaphysis and without, in the midst of soft tissues, independent of the periosteum. Many of us were brought up under the physiological teaching that diaphyseal bone could not be produced without the periosteum. In this connection I would recommend the reading of the Glasgow surgeon's little book on *The Growth of Bone.*

Kellogg Speed's splendid paper, appearing in a recent issue of *Surgery, Gynecology, and Obstetrics,* sheds a wealth of light on the bone growth problem and disturbances following osteomyelitis of adolescent long bones, and he bids us remember "the law of nutrient arteries in relation to growing long bones, i. e., the nutrient arteries are directed toward the elbows and from the knee, and the epiphysis toward which the artery is directed unites first. The fibula is an exception. Consequently, the lower epiphysis of the femur, the upper epiphysis of the tibia, the lower epiphysis of the radius and ulna, and the upper epiphysis of the humerus, all unite last in their respective bones, and must be the most guarded." If the child is young and many inches of growth expected, after two or three years when it is quite positively established that the epiphysis of the damaged bone has ceased all growth and is obliterated, the analogous epiphysis of the fellow bone may be excised to stop its overgrowth. Each bone then grows at an equal rate from the remaining epiphysis and there is no fear of subsequently appearing bowing deformity."

Remember the osteal or medullary origin of these cases and endeavor to localize the point in the medullary canal which was the seat of the first pathology. Remember that primary epiphysitis in acute pyogenic infections is rare.

One may dispute this point because of the frequence of purulent infections in the hip, but, as Colvin reminds us, if we remember the anatomy of the bones entering into this joint and know that the diaphysis of the femur is included within the capsule, we can readily appreciate the validity of the contention. In most of the other joints the epiphysis is so isolated and excluded from the direct effect of the bacterial invasion that hematogenous suppurative arthritis is uncommon, and the swelling so often seen about the joint is purely serous in character. Naturally the resistance of the patient and the degree of virulence of the attacking microorganism will govern the limitations of the devastation.

It is true that there are many points in common in the early symptoms of rheumatism and osteomyelitis. The pain is severe and acute in both, the tenderness marked, and the white cell count increased with the hyperpyrexia.

In rheumatism, it should be remembered, we frequently find more than one joint involved, unless the infection is of the Neisserian type. In osteomyelitis we rarely find more than one locality at the time of invasion, and in this disease we have all seen the white cell count run from twenty-five to forty thousand, while in rheumatism it is not so high. Osler, in speaking of the differential diagnosis, places emphasis on the greater intensity of the local symptoms, the involvement of the shaft or epiphysis, rather than the joints, and the more profound constitutional disturbances in osteomyelitis.

If all cases of rheumatism presented multiple joint affections, Thorning observes, there would be little difficulty. Or, again, if all cases of osteomyelitis began in the midshaft of long bones our mistakes would be few. Not infrequently we find one joint the seat of a rheumatic arthritis, or there are times when the picture presents multiple foci at the inception of an osteomyelitis, and the beginning of the process may be at one end of the tibia or femur, instead of the midshaft.

The usual picture with its symptom complex, which means just one thing, bone infection, and not a rheumatism, is ushered in abruptly by intense pain localized over the shaft or near the epiphysis. The character of the pain is definitely pathognomonic.

Nichols, in *Keen's Surgery,* emphasizes a diagnostic point, that of gentle pressure at some point over the diaphysis a little distance from the point of maximum pain, which at first produces no reaction, but in a moment excites a violent paroxysm of suffering. Very early there appears a slight edema and redness over the affected shaft. With the high temperature, often 104° to 105°, there is delirium and evidence of that profound exhaustion which comes with a blood stream contamination. The wise clinician will not wait for abscess formation and fluctuation, with this perfectly clear picture, but will give his patient that same prompt and wise counsel which he would an acute appendicitis.

Bear in mind that as the pathology advances the pus of an osteomyelitis may perforate into a joint and confuse the picture with a septic arthritis; but it would be a sad commentary on the physician's diagnostic acumen, if he has not recognized the lesion before this disaster has occurred. How often has one seen a delay in the recognition of the pathological condition until the pus has reached the surface of the bone, and the timid operator has satisfied his conscience with an incision of the abscess and a carressing stroke of the bone with a curette. He thinks he has done his duty, while the smoldering destructive volcano within the medullary canal invites his trephine, chisel, and mallet.

Remember, then, that at its inception it is easy indeed for osteomyelitis to play its deadly rôle behind the mask of rheumatism, but to allow the inevitable march of serious sequelæ, without an effort to arrest them, is about on a par with blocking the avenues of escape at the time of a conflagration, while the house and its inmates burn.

It is not within the scope of this paper to discuss this disease in its subacute or chronic forms, or to describe Nature's ingenious effort to wall off the ivory etched sequestrum, or the conservative building of the involucrum, or to measure the value of the wisely drilled cloacus, which serves as a vent for the pent up infection. Nor can we enter into the interpretation of the moving picture presented by the many skiagrams, taken at the various stages of the disease; nor it is possible here to tell the story of the postoperative bone regeneration; all of this will make a chapter in a future paper on these later neglected phases of this interesting disease.

We all recognize that but a short time ago the x ray played but little part in the interpretation of these bone infections. Today we know well the imperative necessity of calling into requisition this diagnostic aid. We know how easily certain forms of a subacute or chronic osteomyelitis may be mistaken for tuberculosis or syphilis of the bone, and how very necessary it is to coordinate the laboratory and clinical findings with those of the skiagram before a definite diagnosis is made.

We all must agree that the survey in the chronic cases has been incomplete unless the study includes a röntgen interpretation, a Wassermann test, a Von Pirquet reaction, smears from discharging sinuses, cultures from the blood, determining the presence or absence of pathological microorganisms.

Upwards of sixty years ago, with infinite wisdom, the great teacher of Jefferson Medical College, Samuel D. Gross, indicated the true relief for acute bone infection when he wrote: "If there be reason to apprehend the existence of medullary abscess, with deep seated, aching, gnawing, or boring pain, with edema of the subcutaneous cellular tissue, the surgeon must not hesitate to cut down upon the matter with the crown of a small trephine as the only chance of averting still more serious consequences." While years have lapsed since this sound advice was given, who will gainsay that this dictum does not ring as true today as it did in the late fifties, when it had its inception in the mind of the master?

The medullary spaces everywhere communicate so that a liberal opening through the cortex of the bone into the infected cylinder provides ample drainage in the acute stage of the disease.

It is generally understood that the bone curette must not be used in the medullary canal, for to traumatize the endosteum would be as irrational as to scrape the membranous and vascular lining of a phlegmon elsewhere in the body, and may lead to a destruction and necrosis in the bony canal (Nicoll-Keen). Bone and marrow regeneration is, of course, the ideal result following the prompt and correct surgical intervention in these acute cases. However, sequestrum formation too often tells the tale of delay, indecision, or incomplete surgery.

One concluding word with reference to eradicating the first cause of an osteomyelitis, that is, the focal infection from which the metastatic process springs, and here we can do no better than borrow from the wisdom of Lewellys F. Barker, who wrote: "These cases must be studied from all viewpoints, and sources of infection eradicated or sterilized. Cooperation is the master word in this business. We must act not along the lines of ill considered and reckless sacrifice, but with due care and judgment, weighing the evidence as it presents itself from the investigation of all sources from which the etiological factor may spring and not from one alone. Working thus, 'in perfect sympathy and uncontending equity,' we are banded together for the relief of human suffering and the prolongation of human life, and shall achieve what must be our professional aim—the cure of those who seek our advice."

Hypertrophied Anal Papillæ (Papillitis)

By CHARLES J. DRUECK, M. D.,
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The transition from the mucous membrane lining the intestinal canal to the external skin at the anus is accomplished in three distinct steps, each forming a distinct zone. In the intermediate zone the epithelium changes to several layers of polygonal cells. Dermal papillæ are found here. The submucous layer is extremely vascular and contains a ganglionated plexus, together with lamellar corpuscles. The muscular coat terminates in slender bundles in the rectal columns, forming the internal dilator muscle of the anus, while the circular layer of the muscular coat becomes thickened into the internal anal sphincter. This internal anal sphincter is of smooth muscle fibres. Below this muscle is the external anal sphincter which is composed of striated muscles.

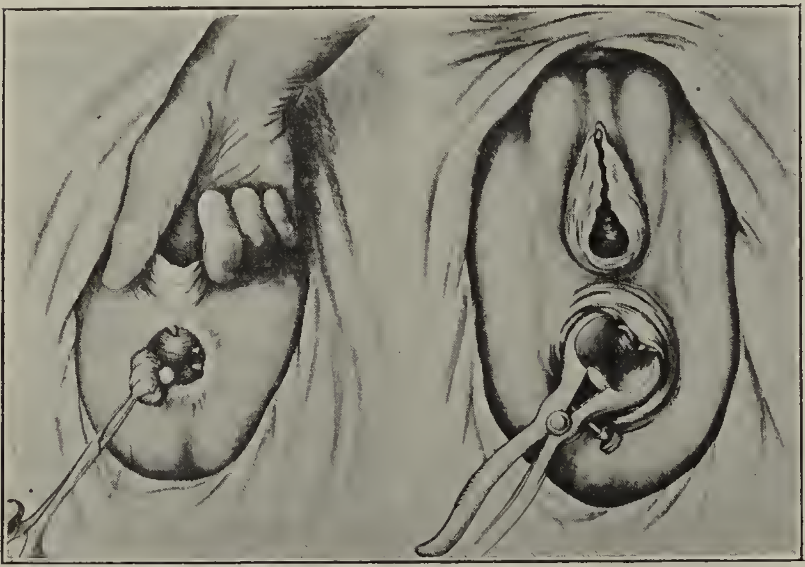

Fig. 1. Fig. 2.

Fig 1.—Hypertrophied anal papillæ exposed by everting the anal mucosa.

Fig. 2.—Hypertrophied anal papillæ seen through the speculum.

On the borders of the anal valves are from ten to fourteen tubercles or papillæ of highly sensitized tissue. These tumors may be seen by everting the anus (Fig. 1), or through an anoscope (Figs. 2 and 4).

The pyramidal teats have a pinkish colored base continuous with the mucous membrane below but a pearl white tip. They are always present although not easily seen except when hypertrophied and elongated, at which time they appear as saw tooth projections with their bases directed upward and inward often associated with inflammation or ulceration of neighboring crypts (cryptitis), and may hang down as long slender ribbons, perhaps an inch long, or may be a rounded balllike tumor easily mistaken for a skin tab or polyp or an anal wart.

Digitally they feel like hard nodules about the anus, although digital or specular examination is extremely painful. These papillæ are tactile organs with a special rectal sense, which if destroyed by a Whitehead hemorrhoidal or other operation permits evacuation to occur without warning. The histological examination of these papillæ is instructive. Several layers of stratified epithelium cover the papilla, the body of which is composed of erectile connective tissue, similar to that of the corpora cavernosa of the penis. In this tissue are numerous thin walled venous spaces with but slender trabeculæ of tissue between them. The veins of this structure have such thick walls as closely to resemble arterioles (Fig. 3).

Each papilla has nerve filaments from the pudendal and the inferior hemorrhoidal trunks. Sensory filaments terminate in tactile corpuscles in the superficial or external mucous membrane structures and in lamellar corpuscles in the cavernous tissue.

ETIOLOGY.

Why these papillæ become hypertrophied is sometimes obvious and in other instances quite obscure. It may be caused by traumatism of the anal canal by foreign bodies, hard feces, repeated replacing of a prolapsing hemorrhoid or polypus, a chronic acrid discharge from cancer, abscess, ulcer or proctitis, digital stretching or prostatic massage, frequent or careless instrumentation, or the rough usage of enema or irrigating tubes.

SYMPTOMS.

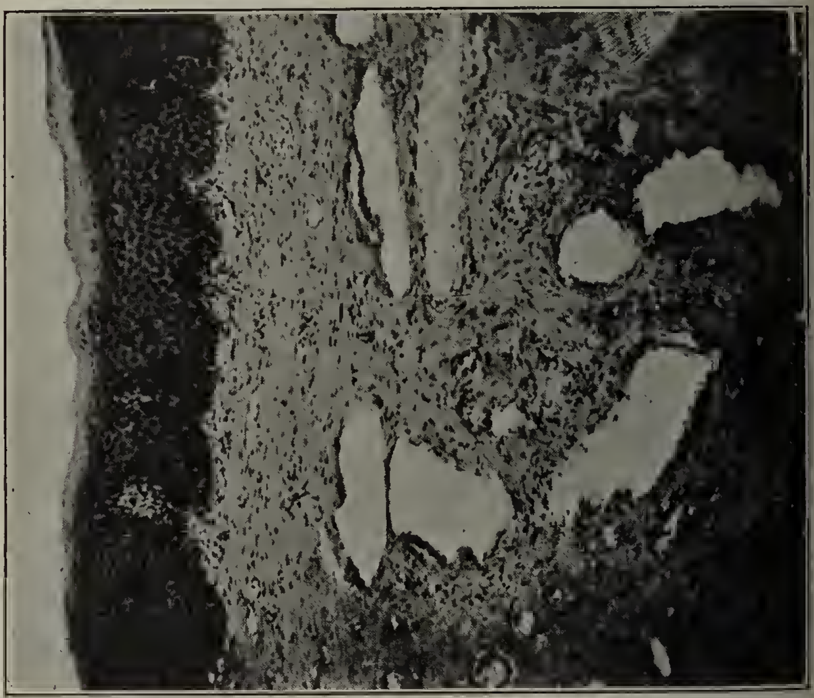

Fig. 3.—Microscopical section of an anal papilla.

Once these papillæ are irritated they set up a chain of neurogenic disturbances which are both painful and otherwise annoying to the sufferer. At each passage of the feces the cavernous spaces engorge and the papillæ are dragged down through the external sphincter until they protrude externally. There is a feeling of fullness and tickling within the anal canal, a sensation of incompleteness of evacuation, and as the engorgement subsides the papilla recedes with a sensation as though worms were being voided or were crawling on the skin about the anus. There is also a consciousness that the anal sphincter is unduly contracted. This seance occurs with each defecation and it may be several minutes or perhaps an hour until by sphincteric compression and by retraction of the mucosa, the papillæ are depleted and resume their former size and position, then the distressing symptoms subside. As the papillæ become hypertrophied and are continuously enlarged, the symptoms are more likely to be constantly present. In some instances the anal sphincter is so spasmodically contracted as to prevent a complete evacuation and the lower rectum remains filled with feces. An enema given at this time will empty the bowel but its administration is painful and therefore objectionable to the patient. Sometimes lumbar or sacral ache is complained of, also vesical spasms and pains down the legs.

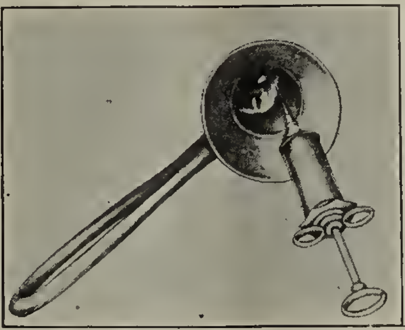

Fig. 4.—Anal papillæ exposed in the anoscope preparatory to anesthetizing.

Although the symptoms of papillitis are quite constant this condition is frequently overlooked and treatment instituted for pinworms, hemorrhoids or pruritis, or perhaps the feces are examined for some irritating factor. Such treatment of course fails to relieve, and the patient is then dismissed as a neurotic when his trouble is all local and really amenable to treatment. If untreated these papillæ may become definite polypoid tumors or the venous congestion be the forerunner of hemorrhoids.

TREATMENT.

All of this troublesome chain of symptoms will be relieved magically by amputation of the papillæ, which is very satisfactorily accomplished under local anesthesia. The width of the anesthetized field may be modified according to the extensiveness of the disease in the case on hand. My technic of regional anesthesia I have described elsewhere.)

When only a few individual papillæ are to be removed the infiltration may be confined to the diseased masses. The needle is inserted into the mucous membrane at the base of the tumor and gradually advanced toward the apex, injecting as we proceed (Fig. 4). Ten drops of an anesthetic solution to each papilla is usually enough. When a number of papillæ are enlarged and the sphincter is hypersensitive it is better to anesthetize the whole anal ring and the sphincter muscle. Having anesthetized the papillæ so that it may be amputated without causing pain it is drawn out with tissue forceps and cut off well below its base. The wound is not sutured. Local asepsis (careful cleansing after each defecation, and a warm sitz bath each day) is all the aftertreatment required. When the patient is discharged he is instructed to continue the ablutions.

Case.—A woman, forty-five years of age, the mother of three children. She had always enjoyed good health and had had no bowel trouble. For two and a half years she had had pain, itching, and a creeping sensation at the anus, was constipated, and felt as though evacuation was incomplete. The anus felt sore. On examination there were found five hypertrophied anal papillæ and one hemorrhoid on the right posterior quadrant of the anus. They were all removed under local anesthesia. Three weeks later the patient reported that she "enjoyed the comfort of going to stool and getting results she had not had for years."

30 North Michigan Boulevard.

Intussusception: A Review of Recent Literature and a Report of Cases

By GEORGE SCHWARTZ, M.D.,
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Intussusception is the most serious abdominal surgical emergency in infancy. The results obtained are directly related to the length of time intervening between the onset of symptoms and operation.

AGE INCIDENCE.

Perrin and Lindsay (1) in a review of four hundred cases collected at the London Hospital for the last seventeen years, found that most cases occurred during the first two years of life; a percentage of about seventy-eight. From the second year to the fourteenth the figures gradually diminished, so that after the fourteenth year there were only eighteen cases; the youngest patient was one day old, the oldest fifty-eight years. Fitzwilliams (2) found that seventy-two per cent. of the cases occurred in children not more than twelve months old, and during these twelve months the condition occurred most frequently during the fifth month, coincident with the teething period and the weaning period with their associated gastrointestinal upsets. There seems to be no relation, however, between summer diarrhea and intussusception. In the cases reported below, the average age was nine months, the youngest patient being six months old and the oldest fifteen months old. Males predominated in the ratio of two to one.

TYPES OF INTUSSUSCEPTION.

In Perrin and Lindsay's series the ileocecal variety occurred in thirty-nine per cent. of the cases, the ileocolic in thirty-one per cent., the interic in seven per cent., and the colic in five per cent. In fourteen cases Hussey (3) found ileocecal in fifty-five per cent., ileocolic in thirty per cent., and enteric in ten per cent. Karewski (4) reports a case of intussusception of the descending colon. B. H. Kingsford (5) reports a case of enterocolic intussusception in an adult forty-six years old. In the series of ten cases reported below, seven were of the ileocecal type and three were ileocolic. In the ileocecal type, the ileocecal valve heads the intussusception in the caput ceci, the caput of the cecum forms the head, the valve and the appendix are drawn in after it. In the ileocolic type, the ileum near the cecum is first invaginated and as the condition progresses, the valve and the appendix have been drawn in after it. In the series described below, the appendix was found acutely inflamed in three cases. However, at times the ileocolic valve remained stationary and the small gut continued to enter the large in such a way that there was no constant head to the intussusception. The compound variety occurred occasionally.

CAUSES.

According to Hussey the causes are twofold, predisposing and actual. The predisposing causes are: 1. The greater mobility of the cecum and ileum in the infant which allows the ileum to form into a nearly direct line with the long axis of the cecum and colon. 2. In the very young infant, the increased size of the ileocecal valve, permitting of an abnormally easy passage of the ileum through it. 3. Pronounced thinness of the intestinal walls of infants.

The actual causes are: 1, Intestinal polypi; 2, Meckel's diverticulum; 3, tumors of the walls of the intestines, etc. Lindsay says that the most likely cause is perverted peristalsis, since the condition is so common in postmortem agonal movements of the intestines, and in fact has actually been observed in the process of formation by several authors. The hypothesis does not, however, explain the frequency of occurrence in the ileocecal region. Likewise, the theory of paralysis of one segment of gut allowing the invagination of another portion does not explain the preponderance of the ileocecal variety.

The stricture of the terminal portion of the ileum and valve at different ages, however, presents an explanation as to why the condition is more common during the first two years of life, and why it occurs most often in the cecal region. The ileocecal valve in a child of six months is annular in shape, covered by a mass of lymphoid tissue, and projects into the lumen for some three eighths of an inch, while the terminal inch of the ileum of the child is studded with masses of lymphoid tissue. During the first year these conditions are at their height, but are gradually lessened thereafter, so it seems possible that acute inflammatory conditions of these aggregations of lymphoidal tissue may be the inciting cause of the intussusception. The narrow lumen at this age also predisposes to the condition, so that with sudden enlargement of the lymph follicles, the gut is stimulated as if it contained a foreign body, and in attempting to expel it, the gut becomes intussuscepted.

The colonic variety may be explained by the relative excessive development in early life of mucosal folds studded with lymphoid follicles. B. H. Kingsford's case of enterocolic intussusception in an adult forty-six years old was due to a polypus. F. Karewski's case of intussusception of the descending colon was due to carcinoma of the colon. In the ten cases described below, no definite etiological factor was found, although in three cases the children had been given large doses of castor oil several days previous to the onset of the symptoms, suggesting a hyperperistalsis as the etiological factor. H. M. Biggs (5) reports a case of intussusception of the ileum due to a benign tumor in an adult twenty-seven years old.

PATHOLOGY.

Pathological changes resulting from invaginations are due to interference with the blood supply to that section of the bowel, caused by traction and pressure of the involved portion of the mesentery. The results are swelling of the wall due to congestion and edema which causes the obstruction and bleeding; if the interference with the blood supply is sufficient, gangrene and sloughing occur. Adhesions due to local inflammatory processes occur between the walls of the intussuscipiens and the intussusceptum, which, with the congestion and the edema, produces irreducibility; finally, the general condition of peritonitis supervenes. Thus, early relief of the circulation of the segment of intestine involved will prevent the latter serious complication which renders operative results so unsatisfactory.

SYMPTOMATOLOGY.

The symptoms are quite uniform, in that the condition is ushered in with cramplike pain, constipation, some bloody mucus discharge from the rectum, and occasional vomiting. In sixty-three per cent. of the cases a tumor was palpable in the abdomen. In the ileocecal variety twenty-seven per cent. presented at the rectum. Stone (7) has found a tumor in eighty per cent. of his cases, but says it is concealed occasionally behind the distended loops of the small bowel; at the onset it is in the right iliac fossa, but very soon it is found under the liver, at the hepatic flexure of the colon where it may be felt, at times only with great difficulty, since it is as yet relatively small and deeply situated. Later the tumor moves toward the spleen and then lower in the left abdomen. Hussey emphasizes one very important symptom which follows acute pain, i. e., the passage of one or more stools of a fairly normal appearance before the bloody stools are passed; in some cases the bloody movements never occur. Stone points out that pallor, cold sweat and other signs of shock occur early. In the ten cases described below, in only one was there shock of any severity. In this case there was gangrene which necessitated resection. On the other hand, the other nine children were playful and their appearance gave no clue concerning the serious intraabdominal pathology. Most of the children seemed so comfortable that great difficulty was experienced in getting the parents' consent to operation. In all of the ten cases there were bloody stools and in seven a tumor mass was palpable.

DIAGNOSIS.

The monograph by Charles B. P. Clubbe, of Sidney, N. S. W., just reissued by the Oxford University Press, gives a very clear description of intussusception. The condition is recognized much earlier now, and the cases come to operation much sooner. Statistics of Holt and Willard at St. Thomas's Hospital, London (8), show a markedly decreasing mortality which Hussey states depends upon early diagnosis, early operation, and improved surgical technic. A previously healthy child who suddenly shows pallor, cold sweats, colic, and occasional vomiting with bloody stools, presents a classical picture of intussusception. Polynucleosis only occurs with gangrene and peritonitis. The temperature is subnormal at first and later slightly elevated. The pulse is generally accelerated.

PROGNOSIS.

The mortality in the Lindsay series of four hundred cases in the London City Hospital was thirty-five per cent. Hussey in sixteen cases had a mortality of thirty-three per cent. The earlier the operation, the lower the mortality. In late cases which require resection, the mortality at the London Hospital was one hundred per cent. Southam and Crawshaw (9) report two cases necessitating resection with recovery in both cases. The first case, in a child three years old, twelve inches of ileum were resected. The second case occurred in an infant six months old, in whom seven inches of gangrenous intestine was protruding from the rectum. The child recovered after resection. These authors assert that a great factor in lowering the mortality is to safeguard the patient from shock by 1, speed in operation; 2, simplest procedure possible, and closure of abdomen by through and through sutures; 3, body heat preserved by bandaging the child in cotton; 4, gas oxygen anesthesia. In one of our cases we resected the lower ileum cecum and part of the ascending colon, with lateral anastomosis. The patient made an uneventful recovery.

TREATMENT.

Operation is the only treatment. Reduction by taxis is the first step. If the bowel is gangrenous and reduction impossible, immediate resection is the only course. The risk of resection is great. In babies, enterostomy is to be avoided, and wherever possible an anastomsis performed. Stone deplores the temptation to remove the appendix, although in three of the cases described below the appendix was found acutely inflamed, thus necessitating the removal of the appendix. In children over five years, the mortality decreases to thirty-three per cent. If resection is necessary, resection *en masse* is preferable to the Maunselle-Barker operation. The avoidance of resection depends upon early diagnosis and early operation, when the intussusception is in a reducible stage. More than one invagination may be present. Few recurrences have been reported after open reduction by taxis. Inflation and injection are rarely efficacious and entail the danger of rupturing the intestine. This former treatment has been discarded. Simple reduction gives the best results.

POSTOPERATIVE TREATMENT.

Water is given freely soon after operation, and breast fed babies are put to the breast twenty-four hours after operation. If the child is very weak, the breast should be pumped and the child fed with a Breck feeder. Older children are gradually fed upon a more liberal diet as progress takes place.

CASE REPORTS.

Case I.—Male child, ten months old, normal delivery, breast fed. The baby was constipated and the mother gave him two teaspoonsful of castor oil, after which he had four normal bowel movements. In the afternoon of the same day the mother noticed that the child was crying continuously, apparently from colic. He vomited twice and had a bloody mucous stool. On admission the child was playful, there was no shock, temperature was 101°, pulse 140, respiration 34. Examination showed a tumor about the size of a fist at the umbilicus, and it could also be felt per rectum. Blood count, white blood cells, 6,400; polymorphonuclears, sixty-one per cent. A diagnosis of intussusception was made. An operation was performed under ether anesthesia, a right rectus incision was made and an ileocecal intussusception easily reduced. Recovery was uneventful and the patient was home in two weeks.

Case II.—Male child, thirteen months old, normal delivery, breast fed. The baby had never had diarrhea but the mother noticed that he had two bloody stools; otherwise everything was apparently all right. No tumor mass felt per rectum or abdomen. The child was playful. Temperature was 97°, pulse 150, respiration 30. Because of the child's previous good health, the sudden appearance of bloody stools, and the subnormal temperature, although no mass was palpable the baby was given the benefit of the doubt and an exploratory laporatomy was performed. Under ether anesthesia, a right rectus incision was made and an ileocecal intussusception as large as an orange was found under the liver, covered by the transverse colon. It was easily reducible, and recovery uneventful. The patient went home in twelve days. This case is similar to the type of case described by Stone where the mass is under the liver and deeply seated and generally not palpated.

Case III.—Male child, seven and a half months old, instrumental delivery, weight twelve pounds; had been on formula since the third month. He had had alternating attacks of constipation and diarrhea. For constipation the mother had given him three teaspoonfuls of castor oil which was followed by five or six normal stools. Next day he had a bloody stool and cried continuously. His thighs were flexed on the abdomen and a large mass was felt at the umbilicus. Temperature was 100°, pulse 150, respiration 40. No blood count was taken. Operation was performed under ether anesthesia, a median incision being made. A large ileocecal intussusception was reduced with difficulty. The appendix was found to be acutely inflamed and was removed. The child suffered from profound shock while on the operating table, but external heat and three minims of adrenalin were administered. Recovery was uneventful, and the patient was home in two weeks.

Case IV.—Female child, aged ten months, normal delivery, breast fed. She had had occasional attacks of diarrhea, and when four months old had ileocolitis (statement of family doctor). She had a bloody stool eight hours before admission to the hospital. No tumor mass was palpable. The child was playful and the general condition seemed excellent. A hollowness was detected in the ileocecal region. White blood cells, 11,000; polymorphonuclears, seventy-seven per cent. Because of the bloody stool and the hollowness in the iliac fossa, although no mass was felt, the diagnosis of intussusception was made. Under ether anesthesia, a right rectus incision was made. A large ileocolic intussusception was present under the liver, which was reduced with difficulty. The appendix was found to be inflamed and was removed. Recovery was uneventful except for an otitis media which occurred on the tenth day which required paracentesis. The patient was home in eighteen days.

CASE V.—Male child, six and a half months old, normal delivery; had been bottle fed since birth, because the mother was an invalid. Baby first had bloody stools five days before admission. Was crying continuously, had colic, and vomited four times in the preceding five days. Physical examination showed an infant in extreme shock, with pallor, cold perspiration, peritonitic facies, crying continuously; temperature 96°, pulse 160, respiration 50. Large tumor was felt to the right of the umbilicus. No blood count was made. Under gas oxygen ether anesthesia a right rectus incision was made. A large ileocolic intussusception was found over a portion of the ileum and cecum gangrenous the lower six inches of the ileum, the ileocecal junction, cecum (including appendix) and one inch of the ascending colon were resected, with lateral anastomosis between lower ileum and ascending colon. No drainage. Complete recovery took place except for a slight wound infection and bilateral otitis media which required paracentesis. The patient was home in three weeks. This case was reported by Dr. Rottenberg and Dr. Schwartz (10).

CASE VI.—Female, aged thirteen months, normal delivery, breast fed, had had one bloody stool six hours before admission; was playful and not crying. Examination showed a mass the size of an orange in the left lower quadrant, easily felt through rectum. This case presented a classical picture of intussusception without shock. A median incision was made under ether anesthesia, and a large ileocecal intussusception was easily reduced. Recovery was uneventful and the patient was home in ten days.

CASE VII.—Male child, aged eleven months, forceps delivery, bottle fed. One day shortly before admission the child had a bloody stool and cried continuously. On admission he was crying and was somewhat pale; temperature 99°, pulse 120, respiration 28. A small mass was palpable under anesthesia in the right lower quadrant. Under gas oxygen anesthesia a right rectus incision was made. An ileocecal intussusception began to reduce spontaneously as soon as the cecum was delivered. Recovery was uneventful; patient home in ten days.

CASE X.—Male child, eight and a half months old, forceps delivery, breast fed, showed marked evidence of rickets. Eight hours before admission to hospital he had had one bloody stool. On admission child was playful, not crying, and was apparently in excellent condition. Temperature 98.6°, pulse 120, respiration 28. Blood count, 11,400; polymorphonuclears, sixty-five per cent. No mass was palpable without anesthesia, but under ethyl chloride narcosis a mass about the size of a lemon was felt in the right upper quadrant. Because of the apparently good condition of the child the mother refused to give consent to an operation, but finally after much persuasion she consented. Under ether anesthesia a right rectus incision was made. An ileocolic intussusception was easily reduced, and the abdomen closed in layers. The child was apparently recovering, but on the seventh day, postoperative, after much crying, the wound reopened spontaneously, and all the small intestines precipitated into the bed. I found the baby in extreme shock, and under ethyl chloride anesthesia replaced the intestines into the abdominal cavity, and closed the abdomen with through and through sutures. External heat was applied and adrenalin given hypodermically, and fluid injected under the breast. The child received an extensive second degree burn on the left thigh from a hot water bottle, and forty-eight hours later, developed acute dilatation of the stomach, and death occurred in eight hours.

CONCLUSIONS.

1. Any infant or child apparently in good health, who suddenly has a bloody stool, should be considered a potential case of intussusception regardless whether a mass is palpable or not, and given the benefit of the doubt by an exploratory operation, providing ulcerative colitis, Henoch's purpura, malena, etc., can be eliminated.

2. All the cases in my series came to operation within twenty-four hours of initial symptoms, except Case V, in which the patient was five days old, where resection for gangrene was found necessary. All the patients were operated upon within three hours after admission to hospital.

3. In this series we would have had practically one hundred per cent. recovery if in the last case the incision had not been reopened and the intestines precipitated.

4. The mortality in intussusception can be reduced to almost nothing by early diagnosis and operation.

5. That vigorous cathartics, such as castor oil, which cause violent peristalsis, may be the etiological factor, is shown in two of the above cases.

6. The decreasing mortality statistics of this series are in accordance with those of Holt and Willard and the St. Thomas's Hospital of London, because of early diagnosis and early operation.

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Cases VIII and IX will appear in the author's reprints.

Malnutrition Due to Carbohydrate Excess*

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Mehlnährschaden (carbohydrate excess) is a form of malnutrition little heard of in this country but quite common in parts of Germany, where a diet largely of malt soups and cereal decoctions is employed for infants by the laity. The feeding of amylaceous foods over a short period of time is properly known to be one of our best dietetic aids in certain types of digestive disturbances, but when given exclusively and over long periods it produces this form of malnutrition. The appearance of symptoms in these cases does not seem to depend so much upon the presence of an excess of starch as upon the relative deficiency of fat and protein in the diet, the disease being thought to be due to deprivation of one or both of these elements.

It has been my fortune to see two malnutrition cases of this variety in the past year. Their histories follow:

Case I.—C. A., female, four weeks old, was brought to the Mt. Sinai Hospital Dispensary with the following history: The chief complaint was diarrhea and loss of weight. She was a first child, full term normal delivery, weight at birth six pounds eight ounces. The family history was negative. The feeding was from the breast irregularly. For the past week the baby had not been nursing well and crying incessantly. The stools had been frequent, loose and greenish, containing mucus but no blood. There had been a great loss of weight.

The child was emaciated, weighing four pounds twelve ounces, skin pale, turgor lost, macular rash over entire body. The fontanelle was slightly depressed! hollowness about the eyes. The temperature was 97.8° F., pulse weak and rapid, respirations irregular. All lymph nodes were palpable. There was a partial cleft palate extending through the soft palate and uvula. The abdomen was distended and tympanitic. The heart and lungs were negative.

The mother's breast containing an abundance of good milk, she was instructed as to the proper way of nursing the child and told to return in a week. Nothing was heard of her for three weeks when she again brought the child to the dispensary. The child at first glance appeared well nourished weighing six pounds fourteen ounces. Upon closer examination the child was seen to be edematous, the skin was pale, stretched, and pitted on pressure. The abdomen was tympanitic anteriorly with shifting dullness in the flanks. The heart and lungs were negative. Close questioning revealed that the mother had nursed the child for two days following her first visit to the dispensary. Seeing no improvement she had placed the child upon a mixture which was found upon investigation to be a watery solution of dextrimaltose. No milk or other food was given. The child's stools had during this period been one to two daily, of a brownish color, dry, with a slight offensive odor. The specific gravity of the urine was 1.010, acid, albumin negative, Fehling's test was positive, microscopical examination negative. The Wassermann tests of mother and child were negative.

Case II.—F. H., female, six months old, was brought to my office with the following history: The chief complaint was a swelling of the entire body. She was a first child, full term normal delivery, weight at birth seven pounds. The family history was negative. She had been breast fed for four months, after that given modified milk mixtures according to formulæ ordered at a board of health welfare station.

For the past week the mother had noticed that the child seemed swollen, that its skin was pale and shiny and that when slight pressure was applied the pitting obtained remained after the finger was removed. She also noticed that the child was less active than previously.

The child at first appearance appeared well nourished, but upon closer inspection was seen to be edematous, the skin of a pasty hue, stretched and glossy over the entire body, pitting on pressure. The abdomen gave forth a tympanitic note anteriorly with shifting dullness in the flanks. The heart and lungs were negative. The stools were large in amount, one to two daily, of a brownish color, slight moisture, acid in reaction with a slight offensive odor. The specific gravity of the urine was 1.012, acid, albumin negative, Fehling's test positive, microscopical examination, negative. The Wassermann tests of both mother and child were negative.

A close inquiry revealed the fact that three weeks previously the mother had placed the child upon a diet of farinaceous foods and water to the exclusion of milk or any other food. The child immediately began to take on weight. In the first week it gained two pounds and continued to gain at the rate of ten ounces for the next two weeks, so that when I saw the child she weighed thirteen pounds four ounces.

The diagnosis was that these were cases of hydremia due to an excess of carbohydrate or possibly to an absence of fat in the diet (*mehlnährschaden*). The children were placed upon a high fat formula, consisting in Case I of fat eight per cent., sugar two per cent., protein two per cent. The following day a severe diarrhea developed, with stools of a greenish color, watery, ten movements in twenty-four hours, the child passing large quantities of urine. Two days later when the child returned to the clinic it was found to weigh five pounds six ounces, and two days thereafter five pounds two ounces, having lost one pound six ounces in four days. The child at this time looked the same as when first brought to the clinic. She has not had a bowel movement in two days. The weight at this time was five pounds ten ounces, the child having regained half a pound in four days. From this time on the child continued to gain at the rate of seven ounces a week. As this improvement went on the amount of fat was gradually reduced and sugar added to the formula until a proper formula for the child's age was reached.

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In Case II the same principle was followed, a formula being ordered which corresponded to the age of the child. Within a period of six days there was a loss of two and a half pounds, following an excessive diarrhea and the passage of a large quantity of urine. Upon stoppage of the diarrhea, the child commenced to gain weight steadily, at the rate of about five ounces a week. The child was discharged after eight weeks weighing fourteen pounds two ounces.

Three types of this form of malnutrition are recognized, the hypertonic, the atrophic, and the type to which my cases belong, the hydremic.

HYPERTONIC MALNUTRITION.

In the hypertonic type, the least common variety, when of mild degree the infant appears well nourished, is not very pale, and many times the skin has a fresh color. The superficial fatty layer of these children is well developed; there is good turgor to the skin, meteorism is a common symptom, they become slow moving and the muscles are of good tone. When this type of malnutrition is of marked degree there is a rigid condition of the muscular system, associated with opisthotonos, adduction of the arms and thighs, and flexion of the forearms and legs. Hypertonia may be seen in other nutritional disturbances than those due to an excessive starchy diet, hence one must rely entirely upon a careful history for a diagnosis as to the cause. An electric current applied to these children in an attempt to ascertain the electrical reactions of the muscles, causes the infant to go into a tetanic state. The prognosis in this type is exceedingly bad, especially when occurring during the first year of life. The only hope for these children lies in their obtaining mother's milk.

ATROPHIC MALNUTRITION.

The atrophic type does not differ much in appearance from an ordinary case of inanition from starvation. There is a rapid and dangerous loss of weight, low body temperature, sunken fontanelle, hollowness about the eyes, pallor and feeble pulse. The skin is pale, turgor is lost and the skin and subcutaneous fat have a doughy feel. Meteorism is common. An associated hypertonic condition of the musculature may be present. In this variety there has been no addition of salt to the diet. The prognosis is bad. Children suffering from this form during the first month of life almost always die. The older the child the better the prognosis as to life. Some of these children may be kept alive by the aid of mother's milk for a while: those that survive are sooner or later carried off by some intercurrent infection because of their loss of immunity to disease.

HYDREMIC MALNUTRITION.

The hydremic form differs from both foregoing types in that the child puts on weight rapidly. The skin is pale, of a pasty appearance and appears well nourished. Early in the course of the affection the turgor is good, later, when the edema becomes noticeable the skin appears stretched, pitting on pressure, meteorism is present. These are children that have been put on a fat free or pure carbohydrate diet. Sometimes there has been a free addition of salt to the diet. Any of these dietary factors may result in a retention of water in the tissues. The retention of water makes the infant at first appear well nourished, but gradually the presence of edema becomes very noticeable, the increase in weight being decided. An acceptable explanation as to how the water is retained within the tissues, has not as yet been forthcoming. That it is present in loose combination is evidenced by the rapid loss of weight in these infants, when taken with an acute infection. Czerny and Keller (1) are of the opinion that this retention may be due to the following causes: 1. Excessive salt in the diet. 2. The presence of a colloidal substance in the tissues. 3. The carbohydrates, when changed to glycogen, retaining four molecules of water.

The younger the infants the greater their ability to retain the water in the tissues. The rapid increase and decrease of the edema points to a chemical change taking place within the organism. Clinical experience leads one to believe that these changes depend upon the natural immunity of the child.

The prognosis in this form of nutritional disturbance is uncertain, being worse in proportion to the youthfulness of the infant, the length of time the faulty diet has been employed, and the duration of the symptoms. The mortality rate is high. Patients will sometimes improve rapidly upon institution of a proper diet, mother's milk being the ideal food. The danger from infection is great because of the lack of resisting power of these infants.

An intolerance for food may develop through lack of food. The prognosis is then unfavorable. In this connection we must emphasize the danger and inadvisability of instituting starvation treatment as the first step in the course of the management of these cases of indigestion, in much debilitated infants. In acute cases it is the proper treatment, when good general health is present, but in patients of feeble strength, it is very likely to precipitate a most dangerous state of inanition.

Unless there is a special therapeutic indication, carbohydrate feeding should not be carried out during the first six months of life, and especially so during the first month. During this period there is a lack of ability upon the part of the organism for a full utilization of an excess of amylaceous food and the ingestion of excessive amounts of such foods incurs danger of digestive upset. It is therefore best to wait for the second half of the first year before adding starchy foods to the diet.

The dietetic remedy in these cases is obvious. Since the trouble is not so much the starch, as the complete or nearly complete absence of fat and protein, these latter ingredients must be supplied and the starch entirely withdrawn or greatly reduced in amount.

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The Selective Action of Drugs and Biological Products*

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Picture a physician of today translated to antiquity, there to take his place among the primitive Greeks. With credit to tradition, he would dwell in a cave, leaving his humble abode mainly to engage in agricultural pursuits and physical encounters with the beasts of the field. On all sides he would behold a people rude and barbarous, and moreover, fearfully conscious of their own weakness. The civilization of antiquity possessed, indeed, a philosophy, but it was a miserable affair. The ancient yearned to know what painted the beautiful colors of the rainbow and covered the valleys and fields with beautiful verdure. He wondered why the pretty flowers contained so many beautiful tints and what held the stars in place in the heavens. But to inquire into the mysteries of nature for a solution of the problems was, indeed, presumptuous. In the midst of his wondrous revery, the ominous sound of the distant thunder bid him pause, and before he could calm his startled frame, a bright flash from the heavens sent him flying to his cave. These ominous portents, in reality simple phenomena of Nature, were in the minds of the dwellers of primitive Hellas, due to supernatural influences. This their forefathers believed, and what they as well as their forefathers believed, was at once too evident to demand investigation, too venerable to be approached by controversy. This veneration for antiquated notions is indelibly stamped upon Grecian as well as other early civilizations, for at no time in its history did ancient Greece concern itself with purely physical speculations. The wisdom of the academy and the lyceum gave much to literature and the fine arts, but practically nothing of value to the physical sciences.

Mankind lives in a world where general and permanent laws prevail, and this the philosophers of old did not succeed in finding out. Nor did the philosophers of some of the later civilizations make startling progress in this department of knowledge, for while of Plato and Aristotle it may be truly said that they gave to the world many and beautiful theories on ethics and morals, yet not a single convenient hypothesis on the laws of Nature or the constitution of the universe did they offer. But something more is needed in the world than ethical codes and moral precepts. The poet and orator of antiquity who stooped to considerations of utility was supposed not to possess the most exalted estimate of his calling. Had Zeno and Posidonius failed to amuse their hearers with sublime and beautiful visions, their names today might not be found in the books. To study, by observation and experiment, the physical constitution of man, or to explore the hidden depths of matter, was regarded as a waste of time.

The philosophy of Greece was rich in rules for the conduct of life, and contains theories, perhaps, relating to every moral truth, yet at the same time it presents practically nothing relating to one of the noblest and most delightful of employments—the investigation of the physical universe. Is it not cheering to the mind and helpful to the general welfare to know the composition of air and water, to know that the planets are held in place by the same force which causes a body to fall to the ground? How utterly insignificant the metaphysical abstractions and dialectical subtleties with which the schoolmen, even of the Middle Ages, amused themselves in comparison with the magnificent discoveries in the physical sciences, therapeutics and preventive medicine which have ended the great epidemics that in past ages threatened to wipe the human race completely out of existence! Why forsake the great discoveries in agricultural chemistry, that are today transforming the sterile waste into the fertile field, and attempt to fertilize a ten acre lot with the thunders of impassioned diction! It is intuitively manifest to thinkers that the study of physical science consists in ascertaining the existence of certain facts and phenomena and in classifying and arranging them. Now it is only by observation and experiment that the facts and phenomena in question can be ascertained and generalized.

Our knowledge of the composition of air and water was obtained exclusively by observation and experiment leading to the determination of certain facts and phenomena. In no other way could it have been obtained. By no deductive process, by no system of *a priori* reasoning could the composition of air and water have been determined. Our knowledge of these two substances was complete when in addition to the constituent elements and the properties of the same, the various relations were determined. And furthermore it may be definitely stated that our knowledge regarding the constituent parts of air and water and the relationship of the constituent parts, as well as the substances themselves, could never have been obtained by reasoning from a few general principles.

Why did the nations of antiquity fail in their contribution to the physical sciences? Why for century after century was the human race in danger of extermination by great epidemics of smallpox and bubonic plague? The answer is not hard to find. The ancient relied, for the explanation of phenomena appreciable to his senses, upon a few general precepts, with the result that he invariably bestowed on trivial and even ludicrous circumstances the dignity of a sublime principle. Medical science, in the comprehensive meaning of the term, was to him an unknown quantity. Of the organization of human beings he knew practically nothing. Obviously, he was also ignorant of the derangement from the natural state of the body that constitutes what is known as disease. In his dilemma he resorted to the prevalent speculative, idealistic, system founded on *a priori* reasoning, gave up in disgust, neglected observation and experiment, and finally left the question to the chimeras of his vivid imagination. Only by direct observation of an individual disease, by the direct study of its own characteristic phenomena, and the relationships of the phenomena, can knowledge of a given malady be obtained. But this is the story of a later century.

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It has been well observed by an eminent historian that the history of civilization cannot be collected from the history of any single European state. Civilization is remarkable for the variety of its elements, its characteristic features are widely disseminated, civilization has never developed itself completely in any one country. Promulgate a single great idea, proclaim to the world a single great principle of civilization and a score of states claim it as their offspring. In considering this, arbitrary choice does not allow the historical writer to select a single point as one from which the seeds of civilization first sprang. It is, however, recognized that nations have transmitted from age to age, something to their descendants that has continued as common stock—it is never lost. This will doubtless continue throughout all time—until humanity has fully accomplished its destiny. What has a given nation done to advance the cause of civilization? If you would find the answer, study its government, its institutions, its industries and its people and you may readily form an idea of what that particular nation has done to advance the cause of civilization.

Study the religious doctrines, the philosophical opinions, and the literature of a country and it is not difficult to estimate the state of civilization attained by its inhabitants. This principle is beyond dispute, so great is its worth. When the student of history reads of the mad prank of the frantic Roman savage Caligula, who upon invading Britain ordered his legions to drive back the ocean and seize its pretty shells as offerings to the Roman deities, it is not a matter of great difficulty to estimate the condition of Roman society in the first century of the Christian era. Hengist, a chieftain of early Britain, gave a gorgeous banquet at Stonehage, in celebration of a recently signed treaty of peace. The arguments were loud. The golden goblets went their rounds. The silver tankards were emptied only to be refilled. At a given moment Hengist cried aloud, "Lay hold to your axes!" From beneath their flowing garments the followers of Hengist drew forth the blades. When morning dawned, three hundred of the guests were lying dead on the floor. Not much time need be consumed in forming an estimate of the state of civilization in the days of Hengist. On the other hand, picture a country with a constitution and a well ordered government, where order is maintained and justice administered, where in brief the people are contented and their affairs are satisfactorily and happily regulated, where the intellectual faculties are kept in a state of activity, this country is in an advanced state of civilization. Now as a matter of fact the word civilization possesses a more extensive significance than is generally supposed.

Civilization means something more than liberty, equality and social relations. It means something more than is conveyed in the records of illustrious individuals who have earned the applause of the community. Now liberty, equality and a perfect state of social relations exist among the inhabitants of a bee hive, but is this civilization? The progress of the individual and the progress of society depend upon the expansion of the mind and faculties of man. Wherever the intellectual part of man advances toward a state of perfection, there exists civilization in its highest form.

Wherever human intelligence is found to be in a state of progress, there medical philosophy advances. Conversely, wherever philosophy is found in the highest form, there will the human intellect be found developed in a state of splendor. Nor is the advance of medical philosophy without its effects on the moral nature of man. Disease begets superstition, and if there is one thing above another well calculated to lower and degrade the moral stature of man, it is superstition. Beyond a doubt, superstition has destroyed more lives than fire, famine and sword combined. Though it has moved through long periods of time, though ages have rolled away since the movement first began, it is a fact that advancing medical philosophy has done more to release man from the bondage of superstition and bring about his moral regeneration than any other factor of which history has a record. It is not a mistake from a rational inquiry into the history of medicine, to state that it has always kept pace with the higher intellectual development of man. Where in a low state of civilization, folly and credulity have marked the actions of mankind, medical philosophy has exhibited the imperfections natural to such an age. When, in studying the early civilizations, it is noted that men were the willing victims of strange delusions, fantastic reasoning and apparently were utterly defective in powers of observation and reflection, though it must be admitted that they were so because of the age in which they lived, it is evident that civilization was in its infancy.

When one reads in history that the physicians of antiquity were magicians and that the ancient worthies attempted to allay the pain of gout with a hexameter from the Iliad, and that they pretended to relieve the sufferings of a rheumatic with a verse from Jeremiah, he may at least chant the strains of the Te Deum for that destiny reserved him for a later age. Unfortunately, the learning of antiquity was the possession of a few eminent men—sages—and their sole object, apparently, was the study of the moral constitution of man and the inculcation of a number of select political maxims. The commonality, in so far as real knowledge was concerned, possessed nothing. In search of information, the humble member of society too often received from the sage the supposedly profound answer, "Know thyself." Thus were the destinies of nations in the hands of a few, and the few enlightened men of antiquity had a rather hard time in seeing anything not comprised in their own ideas. The commonality received the abstractions of the sage as oracular truth. Individual thinking was not in order.

An eminent writer on historical subjects has stated that among the ruins of the Roman empire all the elements of modern civilization may be found. It is difficult in a retrospect of civilization to give tacit consent to the words. Certainly medieval Europe employed all known means to mold these elements into a civilized state and failed. Monarchy, democracy, aristocracy, theocracy and feudalism were all tried and found wanting. Why was the march of civilization suddenly halted? Why were the mighty efforts of Charlemagne and Alfred the Great destined, from the start, to result in ignominious failure? An ignorant commonality cannot be brought to understand the value of a civilization that embraces a constitution, a well ordered government, laws and courts of justice. Medieval Europe was in a constant state of turmoil. Mankind resorted to the wandering life. Nothing was fixed. Governments, states and state boundaries appeared and disappeared in the course of a day. Institutions and languages were in a state of utter confusion. The human intellect, as far as the masses were concerned, was at this period degraded to the lowest level. The masses knew nothing.

There is, perhaps, no more interesting contribution to science than that of the doctrine of the selective action of drugs and biological products. It ranks, undoubtedly, as one of the greatest discoveries given to the world by medical science, bearing as it does the impress of master minds. It has made a deep and lasting impression on every intelligent mind that has examined it. By the common consent of scientific men it occupies a prominent place among the laws of nature. All events leading to the great modern discoveries in diagnosis and treatment are inseparably associated with the doctrine of selective action. Now forever released from the bondage of philosophical despotism, the human mind threw off the coercive influence of ancient teachings, while medicine, ceasing to be an empiric system, became at once a scientific art. The doctrine of selectivity teaches men to think, it teaches them the value of books and libraries in which the results of observation and experiment are deposited. Far more important it teaches men that science cannot be learned from oracles and *a priori* argumentation, and at the same time bids them remember that similar causes acting under similar circumstances always produce similar effects. The doctrine of selective action is moreover a doctrine of utility. It has proved that each cell and fluid in the body has its own structure and is endowed with its own laws. By observation and experiment only can structure and laws be determined. To infer the properties of one class from the properties of another class, independent of experimental procedure, is impossible. Analogical evidence may point out the direction in which researches should be carried out, but nothing more. The existence of determinate factors and the relationships of the factors can be learned only by observation and experimental procedure.

There are at the present time certain agents of the materia medica, which in their now determined actions bear a definite relation to certain structures of the human body. There are also certain symptoms towards the alleviation of which, by the law of selectivity, these agents bear a relation. The present day knowledge of these agents was obtained solely as the result of observation and experiment. In the agents themselves or in the tissues affected, there is absolutely nothing, independent of observation and experiment, capable of demonstrating their action. The development of this doctrine, in its nature and extent, receives apt illustration from the study of the atropine series.

In physiological doses, the atropine series by selective action paralyze the terminal filaments of secretory nerves. In the presence of deficient secretion in a gland, after the administration of a member of the group, the effect is due not to any direct affect on the protoplasm of the secreting cell, for atropine is not a protoplasm poison, but is due entirely to the selective action of the agent on the terminal fibres of the secretory nerves. Atropine also, by selective action, paralyzes the terminal motor nerve filaments in unstriped muscle and by paralysis of the terminal fibres of the oculomotor nerve, the iris, an unstriped muscle is paralyzed with resultant dilation of the pupil of the eye. Now there are certain animals, birds and reptiles, whose pupils are not dilated by the atropine group, by reason of the fact that the iris of these animals consists of striped muscle whose nerve terminations are in no way affected by this group. That the action of the atropine group in paralyzing unstriped muscle is by virtue of a selective action on the terminal nerve filaments is conclusively demonstrated. Of this nature affords a still more beautiful example in rabbits and cats. The esophagus of the rabbit consists entirely of striped muscle—it is unaffected by the atropine series. In cats the upper part of the esophagus is composed of striped muscle and the lower part of unstriped muscle. The atropine group breeds true to its law—the lower part only of the cats esophagus is paralyzed by this series. Now science has further demonstrated that certain agents, by selective action, stimulate the same peripheral nerve terminations that are paralyzed by atropine. The atropine series check secretion by paralyzing the terminal filaments of the secretory nerves while the pilocarpine series, by selective action on the same structures, not the protoplasm of the secreting cell, stimulate and cause increased secretory action. On the eye, the selective action of the pilocarpine group manifests itself by stimulation of the terminal filaments of the oculomotor nerve, which as previously noted are paralyzed by atropine. On the terminal filaments of the pneumogastric nerve, selectivity of action is evident by reason of the fact that while the atropine series paralyze the end fibres of that structure, the pilocarpine group shows a stimulant action.

Physostigmine may also be placed in the same category, for by virtue of its selective action the drug resembles the pilocarpine series. Its antagonism to atropine renders plausible the generally accepted theory that physostigmine, by selective action, stimulates the terminal filaments of the oculomotor nerve. In their action upon the cerebrospinal system, certain drugs serve only to illustrate the doctrine of selectivity. By virtue of selective action on the lower segments, medulla and cord, strychnine increases the reflex activity by facilitating the passage of afferent impulses and these impulses reach a large number of muscles whether their cells are in the poisoned area or not. Atropine acts on the higher division, stimulating the motor cells of the cerebrum. And what more conclusive evidence is needed than that afforded by the selective action of caffeine on the psychical functions and the fact that nicotine, coniine and curara select the nerve ganglia as the point at which to unfold their actions, differing from the atropine and pilocarpine series which by selectivity affect the terminal nerve filaments only? The elective affinity of drugs for certain tissues is again brought forward in considering the action of curara. While the atropine series paralyze the nerve endings in unstriped muscle, curara paralyzes the motor nerve endings in striped muscle only, the heart excepted. It does not affect unstriped muscle. True to the law, curara shows no effect on the human pupil, composed of involuntary muscle, but on the pupil of birds, composed of striped muscle, curara manifests a rapid action. This strict demarcation of curara action is noted in organs composed of both striped and unstriped muscle. In the esophagus of mixed tissue, curara paralyzes the striped structure only, the atropine group paralyzes the unstriped tissue. Of this great doctrine it is unnecessary to multiply illustrations from the materia medica, for with a rigorous adherence to the advances of laboratory methods in diagnosis and treatment, it is evident that the solution of the problem of disease is in the use of biological products. But the lesson is an instructive one.

Prior to observation and experiment, without a knowledge of the doctrine of selectivity, it was impossible to employ in a scientific manner the various substances offered by Nature for the alleviation of human suffering. In what manner the various agents were endowed with the property of arresting or controlling the morbid processes in the body, mystified physicians from the beginning of time. The doctrines which in days past have pervaded and controlled the medical world were false and pernicious, in that while that pretended to explain the manner in which therapeutic agents produced their results, this was the very point upon which their knowledge was radically deficient. By the doctrine of selective action only can the effects of remedial agents be explained. The doctrine of selectivity has moreover led to a knowledge of the relations that exist between morbid processes and biological products.

Nor is the great work of relieving human suffering confined to therapeutic applications. In diagnosis, specificity in the relationships of various biological products has enabled science to differentiate morbid processes with wonderful accuracy and rapidity. The phenomena of hemolysis furnish a beautiful illustration of the doctrine of specificity. The principles involved were brought to light only as the direct result of observation and experimental procedure. Hemolysis depends upon the interaction of certain definite factors upon erythrocytes. Amboceptor alone is capable of sensitizing the red cell—the coordinate action of complement is absolutely necessary in order to produce hemolysis. Selectivity is the rule. When every link in the chain is present, the action upon the red cells is at once manifest. No intervening phenomenon destroys the directness and simplicity of the interaction of amboceptor and complement on erythrocytes.

The Widal reaction, the determination of the unknown typhoid antibody, is in strict conformity with the law of selective action and future developments in diagnosis in the determination of an unknown antibody by means of a known antigen, depend entirely upon the law indicated. There is no greater boon given to mankind than the complement fixation test, and this diagnostic revelation, in its every feature, bears the marks of the law of selectivity.

In therapeutics, the medical profession has given to humanity discoveries destined to solve the problem of disease—antitoxin treatment and preventive medicine by vaccination. In the production of diphtheria antitoxin, the law of specificity prevails, and in the treatment of the disease the same law obtains, for by selective action, diphtheris antitoxin neutralizes diphtheria toxin only. In the treatment of tetanus, the words apply with the same force, for tetanus antitoxin, by selectivity neutralizes tetanus toxin, diphtheria toxin—never. Of more than passing interest is consideration of the effects on the human system of the toxic products of the tetanus and diphtheria bacilli. The former acts, by selectivity on the spinal cord, while the latter is so strong in its affinity for epithelial cells that the diagnostic test for the differentiation of the diphtheria bacillus from morphologically allied organisms is settled conclusively by the well known action of diphtheria toxin on the epithelial cells of the adrenal gland.

Of interest at the present time, from a clinical viewpoint, are three diseases, which in their pathology may indicate the direction of future researches. Can any one fail to note in studying the pathology of poliomyelitis, in which the lesions are in the main confined to the large multipolar cells of the anterior cord, that an etiological factor having a selective action on these cells must be sought? Does not lymphatic leukemia suggest, by the doctrine of selective action, an agent whose activity is in relationship with the lymphocytes? In progressive pernicious anemia is there not a hemolytic agent in direct relationship with human erythrocytes? In the thoughts themselves the laboratory worker may find the fondest hopes and expectations. How have these almost transcendental findings been determined? Certainly not by recondite processes of *a priori* reasoning.

It may be stated that they have determined by the direct observation of facts and phenomena and the pronouncement of a law based upon an absolute and rigorous generalization of the facts and phenomena. Wholly and absolutely irreducible in their nature, they constitute a science which needs no metaphysical abstractions to insure its foundation. What the world desires is a medical philosophy that shall investigate the resources of Nature, that shall increase in number the physical comforts of mankind, that shall dignify and ennoble the human intellect to the end that the earthly condition of humanity may be improved. The world demands a philosophy capable of reaching and elevating the masses, it is in no way interested in a system of probabilities which has no other purpose than that of amusing a limited number of scholastics in the delightful contemplation of angels, invisible essences and beatific visions. A higher civilization, founded on the idea of the diffusion of knowledge among the masses has given to humanity a glorious message. Under the new dispensation mankind departs from the darkness of mythology, boldly follows a scientific method of inquiry, a method that holds aloft a new ideal, and places medicine upon a foundation that holds out to thinking men the possibilities of great achievements.

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Clinical Psychiatry

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This paper is intended to show that the physiological symptoms of insanity, such as salivary acidity, blood pressure phenomena, disturbance of involuntary nervous system, *et al*, have a relation to visceral disorders; and that the recovery from insanity is dependent upon the cure of the disorder.

Two years ago I reported my observation on two patients with mental disorder showing outstanding physiological characteristics which were especially interesting to me. Lawrence Henderson had but shortly before written, "Neutrality is quite as definite and quite as fundamental and quite as important a characteristic of the organism as is its temperature or osmotic pressure," and Shelford had announced, "Protoplasm possesses a definite mechanism for maintaining approximate neutrality."

The characteristics in these two cases were that in one the saliva was continuously alkaline and in the other always acid. These reactions were obtained by tests with litmus paper made every waking hour for a considerable length of time and showing no variations. (The perspiration and urine corresponding.)

We then tested fifty patients in the same manner and found that this condition was common among these patients, so many acid—so many alkaline; physiological symptoms, blood pressure, conditional reflexes and other manifestations, merging into corresponding groups. Thereupon we instituted acid and alkaline treatments in the endeavor to neutralize the solution and to encourage rehabilitation of cells, bearing in mind Henderson's and Shelford's pronouncements.

The patients with melancholia present in some instances interesting charts of acid and alkaline balance shown by litmus tests of the saliva made every hour during the waking period. During the earliest part of the disorder they are continuously acid. As treatment progresses alkaline reactions are more and more detected and these appear to be in direct proportion to the mental improvement. The condition of the teeth had little or nothing to do with the mouth reactions, for there was no work done on the teeth during the period of illness and the reactions changed with the physical condition, the teeth remaining the same throughout the whole period.

Case I.—Mr. D. had upper and lower false teeth. The first part of the chart showed continuously acid reactions; slowly, as his heart action and blood pressure were regulated and he was neutralized with sodium bicarbonate, there appeared alkaline reactions, until they reached a point where he showed as many alkaline reactions as acid each day. At this point he was normal mentally. His blood pressure had descended, his heart action was good, and he showed both salivary reactions at different times of the day.

Case II.—Mrs. W. had her abscessed teeth removed a month previous to admission. She was profoundly depressed, had a poor myocardium, low blood pressure, and acid mouth continuously. These symptoms changed gradually and when she reached a point where the acid and alkali balanced, she had recovered her spirits and her mental poise.

Case III.—Mr. J. H. had abscesses in two teeth all during his illness and still had them on the date of his recovery. His reactions were continuously acid during the early time of his disorder and the change in reactions and in spirits seemed coincident with the withdrawal of meat from his diet, and it is to be noted that the mouth reactions changed independently of the condition of his teeth. These cases show that litmus paper can be used in such conditions quite as a thermometer is used in fever cases.

The next case that was enlightening was one exhibiting attacks resembling Gower's description of vagal attacks. This young man had a constantly acid mouth, excessively acid urine, high normal H ion in blood, but what was notable was that all his symptoms were pneumogastric in type. He improved greatly on taking soda bicarbonate for its neutralizing quality and belladonna to inhibit the physiological symptoms. However, the cause of all this was not yet discovered, but there seemed to be a clearcut salivary acidity with definite vagus correlation. We suspected a gastrointestinal background and so started a research with the proctoscope in all cases. With this instrument we observed that in the mental cases there were mucous membranes in various conditions, but scarcely a membrane that could be called normal. They varied in appearance from an angry red to a cloudy swelling, atrophic condition. We examined forty cases in this manner until it seemed evident that regular gastrointestinal studies should be made of the stools by gram stain, Schmidt test, cultures, counts, gelatin liquefaction, and other laboratory methods. So another series was done of fifty cases. There was found to be eighty per cent. showing definite gastrointestinal syndromes, as worked out in clinics for that purpose, of indolic, skatolic, saccharobutyric correlations. These tests were made on all nervous patients; of the acute insane one hundred per cent. showed definite types of intestinal pathology.

Aside from any mental symptoms we now had evidence of a number of physiological disturbances to correlate. 1. Salivary disturbances in forty-eight cases. 2. Blood pressure curves in one hundred cases. 3. Disturbance of the involutionary nervous system in many. 4. Proctoscopic evidence of intestinal pathology (whether the cause or effect of the psychosis) in forty cases. 5. Putrefaction or fermentation or mixed, tests of stools, fifty-one cases.

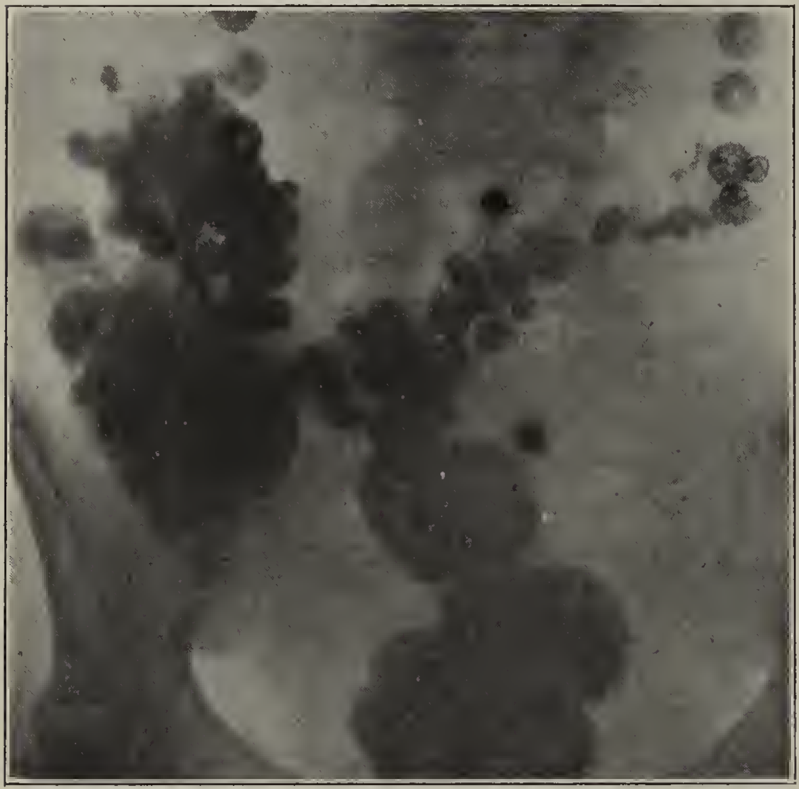

FIG. 1.—Dementia præcox three years' duration showing type seen in these cases dilated cecum and spastic colon; no improvement by treatment indicating that to get results treatment must be instituted in the early stage.

A case now presented itself with symptoms in all the above. Strongly influenced by the idea that serious gastrointestinal trouble might be the very root and cause of these conditions, we had this case fluoroscoped and got a picture of pronounced ptosis of the colon with fifty hours stasis.

This girl had an acute mental illness. Menstruation had lately been irregular and stopped altogether for a period of four months. The mental symptoms resembled precox. There was some indican in the urine, she was bilious in appearance, dry skin, coated tongue, color of skin denoting toxemia, blood pressure low, no focal infection demonstrable, excessively acid mouth. The proctoscope showed red angry membranes. There was no correlation between fecal bacteria and Schmidt's fermentation tests. Cultures of colonic mucous membrane developed hemolytic streptococcus. The fluoroscope showed stasis in the cecum and in the ptosed transverse colon. This case was therefore easy to irrigate as far as the cecum and thus drain the static area. The patient was also treated to raise her blood pressure and reduce the acidity.

She made a most satisfactory recovery due chiefly, I believe, to thorough irrigation. Her acidity disappeared, her blood pressure came up, the bacterial flora in the stool became normal and her mental condition recovered.

Studied at the same time was a girl with quite identical symptoms but the fluoroscope showed the whole intestinal tract immobile from the cardiac end of the stomach to the sigmoid. This patient has not recovered.

Another case with all the symptoms of precox with the bilious appearance, the inflamed colon, and other signs, showed upon fluoroscopic examination stasis at the illeocecal valve (seventy-two hours). This patient was relieved by an appendicostomy, in this way introducing salt solution and washing and draining the static area. The patient made an excellent recovery. All three of these examples were fresh cases. All had inflamed colons, acid salivas, and pronounced symptoms of dementia, as I understand dementia præcox.

Recovery in the two cases and not in the other one seemed dependent on the accessibility of the static area in the bowel to drainage. The saliva charts indicated the same condition as in the melancholias, and when they recovered they were neutral. Efforts were made to reduce the acidity by alkalies, and to control the physiological symptoms of blood pressure and other symptoms by the use of internal secretions.

Insanity is not such a simple matter that we can say that it is caused by pathology in the bowel. There are so many types of insanity that it would be absurd to put all forms down to one pathology. I have made a great many x ray pictures, and in manic depressive patients I have found as yet no bowel abnormality; but in all cases that are admitted into the hospital in the acute stage of what seems to be dementia præcox, the appearance is that of biliousness, i. e., coated tongue, dry skin, flushed face. They present the appearance of sick persons and the x ray shows intestinal abnormality. In none of this am I describing chronic cases, all the material is from acute conditions.

Ruling out those cases where there may be sinus disease, tuberculosis or some other such pathology, there will be found a large group where the trouble is in the bowel and when these patients are treated along the line of gastroenterology they recover.

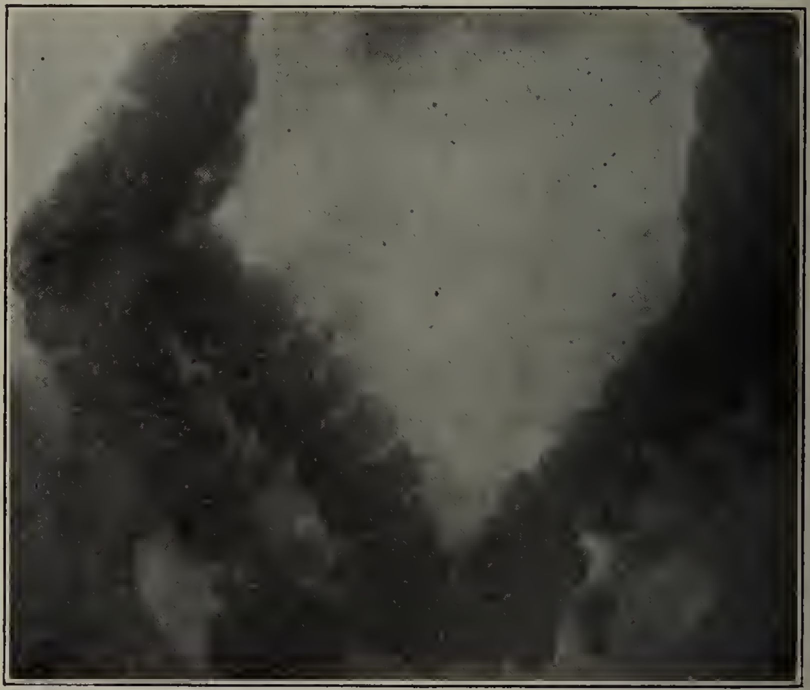

FIG. 2.—Ptosis transverse colon; descent of cecum, twenty-four hours, type of case which was restored with the help of irrigation.

We are confronted by the problem of the toxemia of these visceral disorders. Are they due to the toxic product of incomplete digestion? Are they due to breaking up of the dead bacteria and the resulting poisons? Or are they due to direct infection of the mucous membranes? In my opinion the most probable answer is Adami's theory of subinfection. Adami says, "The evidence is now complete that bacteria introduced or multiplying in the upper alimentary tract are recoverable from the cervical and the mesenteric lymphatic system and from the circulation." And he says further (1), "A low grade infection of the mucous membrane has a relation to stasis." Adami's article is well worth perusal. If these visceral disorders are caused by the toxic product of incomplete digestion, or by the poison of dead bacteria, a vigorous cathartic would be an effective means of curing or at least of very greatly improving the patient's mental condition. As a matter of experience, however, a long and thorough course of elimination together with a diet in which bacteria will not grow, are necessary to the success of the treatment, indicating that the mucous membrane is affected.

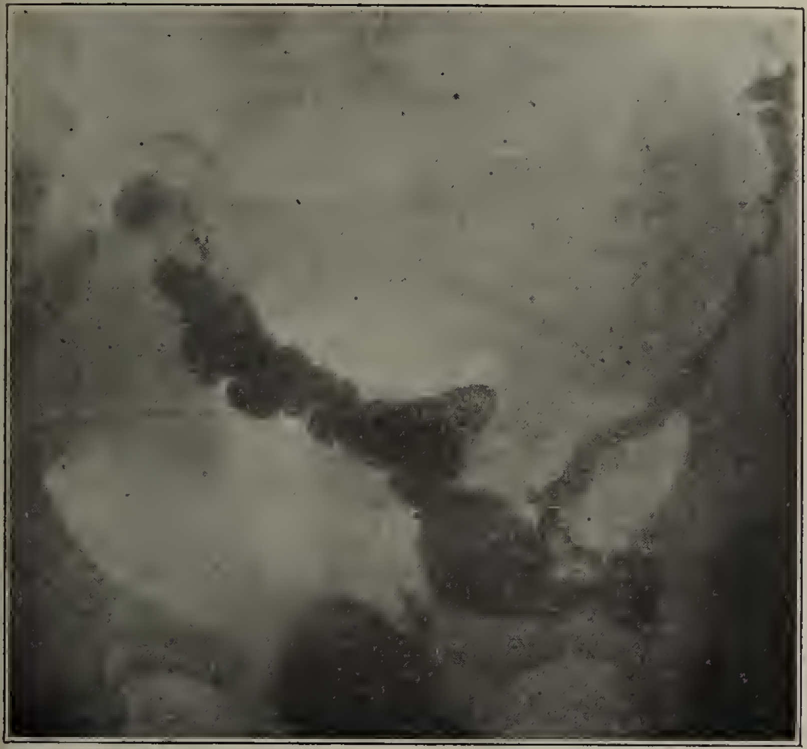

Fig. 3.—Marked ptosis with colitis; picture following enema showing mucus.

In my x ray work I have found three distinct types, with variations. They are ptosis of the colon with stasis; dilatation of the cecum with spasticity of the transverse colon; abnormalities making stasis, as the V colon.

My own understanding of this abnormal pathological anatomy is widened by finding the same condition in children as young as five years. We may infer that persons are born with malformed areas or arrested development in the bowel, in others the abnormality is developed in early childhood through persistent constipation, from rickets or other diseases. It is by no means necessarily acquired in adult life. Here, in the bowel, is the point of least resistance and therefore of liability to subinfection. The pictures presented by young children suggest to me that they are internal stigmata of degeneration we are here dealing with, and of far more importance than outstanding ears or palatal arches. The x ray clearly reveals the deformity and the stasis (though the observer must not be misled by apparent anatomical defects which are really caused by posture) and the resultant conditions, physical and mental, can frequently be cured.

The children, between five and fifteen years old, who were brought to the mental clinic were nervous, had uncontrollable emotional outbursts, would not pay attention, showed little retentiveness, and were all backward in their studies. Every one of them was brought up to the required mental grade and into normal child life by gastroenterological treatment.

The question may be asked, Why do not all cases of marked ptosis exhibit symptoms of insanity? My answer would be that to result in mental disturbance there must be also stasis, and I have found this condition when the patient was not conscious of constipation, for instance in one case where the patient has regularly two bowel movements a day the fluoroscope showed barium retention of seventy-two hours. This condition of the intestine offers but slight resistance to poison and in persons with susceptible nervous systems the toxemia affects the mental balance through subinfection.

My conclusion, therefore, is that salivary and secretory disturbance, physiological and vagus symptoms are all essential to the diagnosis, but in no case should the fluoroscopic observation be omitted, for the treatment based upon its record has been eminently successful. The mental disease is warded off or overcome by preventing the recurrence of the toxemia in the area of subinfection. This prevention can be accomplished by the periodical examination, high irrigation, and diet.

I do not assert that every case that we have been accustomed to diagnose as dementia præcox will prove to be gastroenterological, but I am convinced that in many cases the apparent mental disease is in reality a mental symptom of intestinal disease.

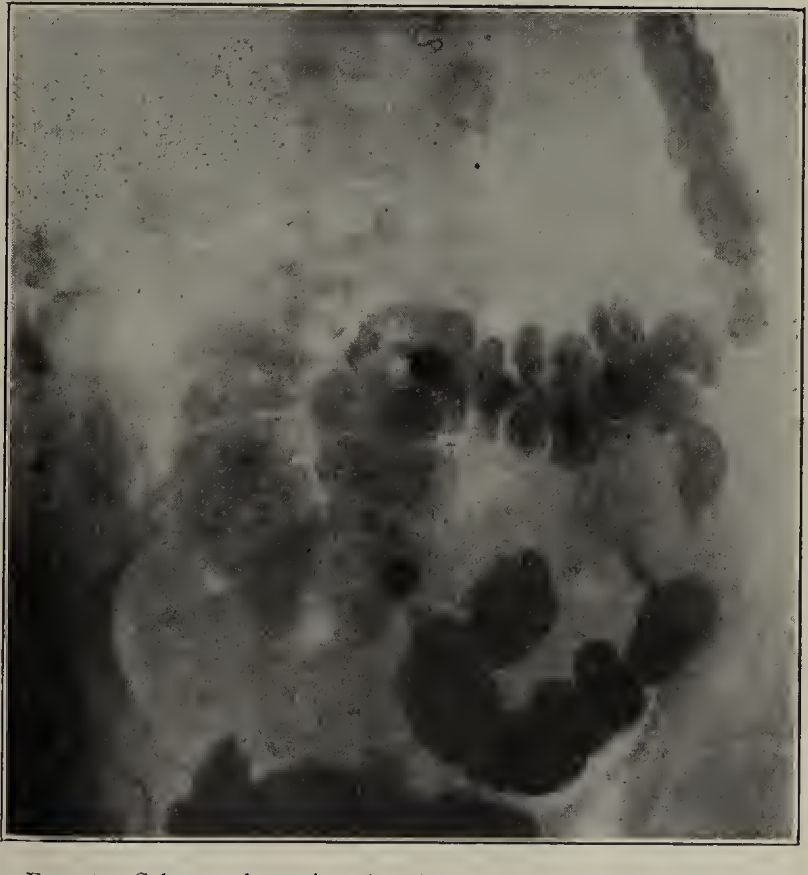

Fig. 4.—Colon and ptosis; chronic chorea and mental symptoms improving under treatment.

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The Preschool Age*

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The problem of the preschool child deserves more attention than it receives at present; it should interest not only physicians, but also physiologists, economists and philanthropists. In the United States, children under five years of age constitute nearly twelve per cent. of the total population; in this twelve per cent. of the population, occur twenty-one per cent. of all deaths in this country. About three million infants who are born alive do not live to celebrate their fifth birthday; this is the toll of death which the civilized world pays every year; in spite of this great loss of life, there is hardly any interest shown by the laity or by the general medical profession. If an equal number of stray dogs and cats were to be put to death, what a howl the whole world would raise, but this needless sacrifice of human life goes on without protest. The main reason of this indifference or lack of interest is ignorance of existing conditions. The problem of the preschool child is indeed a sad one, when one realizes that seventy per cent. of the deaths are preventable and that a large per cent. of the preventable deaths are purchasable. The reduction of deaths at this age is indeed a subject for "dollar diplomacy."

In the registration area (1918) (seventy-eight per cent. of the total population), of a total death of 1,471,367 persons, 306,143 were children under five years of age. At this rate, there were 400,000 deaths under five years in a total death of 1,900,000 in the whole country (i. e., 20.8 per cent. of the total population). The younger the preschool child the less likely is it to survive the fifth year.

The deaths from whatever viewpoint they are studied leave no doubt that the early weeks, the early months, and the early years of life are by far the most dangerous. The danger of death diminishes steadily with the increase of the years; the second year is less dangerous than the first; the third year than the second, the fourth than the third, and the fifth than the fourth. With every year of life the child grows fitter to resist death. If he can get safely to the fifth year he has a much better chance of passing beyond it. The primary problem of nurture is how to bring the child forward from the danger of his first year to the relative safety of his fifth year.

Age	*Total number*	*Percentage of total population*	*Percentage of all deaths*
Infants under one year.....	2,217,342	2.4	13.
Children one to two years....	1,976,472	2.1	4.
Children two to three years...	2,166,492	2.4	2.
Children three to four years..	2,156,141	2.3	1.2
Children four or five years...	2,114,917	2.3	.9

Thus it is evident that two thirds of all deaths in children under five years of age occur in the first year of life.

The important causes of deaths in infants under one year are diarrhea and enteritis (twenty-nine per cent. of all causes), premature birth and congenital debility and injuries at birth (twenty-five per cent.), the respiratory diseases, 15.8 per cent.; diseases of the nervous system, 5.1 per cent., and malformations, five per cent. Of all deaths recorded in the registration area from digestive disturbances, forty-seven per cent. occurred in infants under one year; it is also interesting to note that eighty-five per cent. of deaths from convulsions, fifty-four per cent. of all deaths from pertussis, fifty-one per cent. of deaths from gonorrheal sepsis, fifty-one per cent. of deaths from lues, twenty-four per cent. of deaths from respiratory diseases, and twenty per cent. of all deaths from tuberculous meningitis occur in infants under one year.

In children under five years but over one year the most important causes of death are the infectious diseases (fifteen per cent.) (pertussis, 6,100; diphtheria, 5,500; measles, 4,100; scarlet, 1,000); the respiratory diseases, twenty-eight per cent.; digestive disturbances, eighteen per cent.; accidents and injuries, five to six per cent. (6,000 cases every year); tuberculosis, four per cent.; diseases of the nervous system, four per cent., and diseases of the circulatory system, seven tenths per cent.

The predisposing causes of mortality and morbidity at this age are the same as those encountered in our study of infant mortality. They are poverty, ignorance and neglect. To disregard these fundamental factors is to court failure in any attempt to reduce mortality and morbidity at any age.

It is practically impossible to avoid the subject of family income when talking about child welfare, because it lies so close to the very root of all work for the interests of the child. If the income of the father is not enough to cover the necessities of life and does not permit a minimum normal standard of living, then either mother and children are driven into industry and home life is neglected or else the standard is lowered, and we have bad housing, undernourishment and all other hideous results of poverty. In Chicago those who have been working on the problem recently, figure that it costs approximately fifteen hundred dollars a year to buy the essentials for maintaining the average family of five (father, mother and three children) at what we might consider a normal standard. That means, of course, a minimum wage of about five dollars a day for the working man. As conditions exist at present, the cost of living must come down or there must be a nationalization of financial responsibility which will relieve the individual family of a portion of the cost which they must now bear, or wages must rise to cover the cost of living so that every child may have his adequate opportunity for normal development.

As regards the importance of domestic economy, it has been well said that "the household is the ultimate agency of distribution of economic wealth to individuals"; what the wage earner secures and the wife and children secure depend upon the efficiency of the use made of the income by the household. The home can be, in fact usually is, responsible for malnutrition and unsanitary living, notwithstanding that liberal wages may be earned, from want of appreciation or knowledge of the relative values or in methods of preparation of foods, or wasteful expenditure in valueless things.

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*Read by invitation at the New York Academy of Medicine, January 13, 1921.

Poverty leads to living in unhygienic surroundings, and in unsanitary homes. The home should be the foundation of social improvement. We must crystallize the truth of it in an accepted civic code such that not only shall protective housing laws appear in every city and state statute books, but the movement for better housing shall sweep beyond protective law to demand something more than a shelter, to demand a home.

There is nothing mysterious about good housing. The details of building so as to get light and air and to give privacy and convenience are in the main solved to a point where it is known that a certain kind of home will safeguard health. The longer the bringing in of the era of improved housing is delayed, the more does society and the state pay the bill in the broken lives of children and adults. The moral effect of bad housing is not often as apparent as the physical. Two thirds of the delinquent children come from homes that no city should permit to exist.

Ignorance on the whole is one of the most important of the predisposing causes. Where illiteracy prevails, the mortality and morbidity are correspondingly high. I think we physicians are too presumptuous when we speak of the ignorance of the laity, and before we pull out the mote from the eyes of the laity it would be well to cast out the beam that is in our own; for surely, if the blind lead the blind, both shall fall into the ditch. How many of us know anything about the problems which concern the public welfare and of those that do, how many care to give any of their time to help the public servants solve these problems. Education like charity should begin at home. The nurse reflects the knowledge of the physician; and the information which nurses often disseminate in the name of education tempts one to exclaim, "Oh, education, what ignorance is spread in thy name."

HEREDITY.

Heredity plays an important part in childrens' mortality; it acts both directly and indirectly; certain diseases, such as syphilis, are directly transmitted to the offspring; in tuberculosis only the tendency to acquire the disease is transmitted; general debility of the parents means congenital debility of their offspring. Many nervous affections also are directly transmitted to the offspring. Of all diseases mental deficiency is most apt to be transmitted by descent; miscarriages and stillbirths and infant mortality are much higher among idiots.

The mortality of children whose parents are alcoholics is very high; alcoholism leads to miscarriages and to prematurity; fifty per cent. of the children of drunken mothers are born dead or die within the first few years of life; the children of alcoholics are often neglected; the daughters of such parents make poor wet nurses.

Neglect of the infant may be intentional or unintentional. In cases of mothers who are compelled to work to support themselves and where the infant is entrusted to an older child, the neglect of course is unintentional. Also, in cases of mothers who have six, seven or eight little ones, a few of them must be neglected; and it has been proved that mortality is much higher in families where there is a rapid succession of pregnancies; not only must some be neglected, but a few of necessity must be brought up on the bottle; the mother's health also becomes undermined and in consequence this leads to the birth of infants who are atrophic. Thus there is a vicious circle formed. It is sad but true that not a few infants die every year from wilful neglect on the part of the mother; most of these infants are of illegitimate birth.

ILLEGITIMACY.

The mortality among illegitimate children is almost double that of the legitimate; it is said that three out of every four illegitimate children die before they are one year old and that the fourth is destined to a life of crime or prostitution; it is these children that make up the high mortality of large cities. Illegitimate children constitute about four per cent. of the total births, but the deaths constitute twenty-five to thirty per cent. of the total deaths of infants. Nearly forty per cent. of infant deaths under one year in New York city occur in infants confined in institutions, and a great percentage of these are illegitimate children.

At the infant milk stations one very frequently meets women who are married nine, ten or eleven years and who have gone through as many pregnancies; many of these children are dead; the mortality in these families is out of proportion high; the rapid succession of births exhausts the mothers and compels the infants to be brought up artificially; many of the infants on account of the exhausted condition of the mother are born prematurely; many of these children are unwelcome visitors. The remedy is simple; it is easy to suggest, but it is hard to carry it out; when one speaks to these mothers, they say it does not depend on them, and in the majority of cases it does not. When such mothers ask a physician what can they do to prevent conception, it is futile to tell them not to have sexual intercourse and expect them to heed one's advice. Nothing that the doctor may say will make such intercourse unpopular with the poor and ignorant whatever the consequence may be; this is a subject which most physicians dread to touch upon, but it is a real live subject which must be solved. There is no reason why a physician should not advise a woman (where there are proper indications) how to prevent conception; such advice may save the lives of many mothers as well as of many children. This does not mean that the information should be given by women of deficient mentality and of doubtful sincerity.

Of other predisposing causes, we can mention only the most important ones, such as race, nationality, color, density of population, climatic and meteorological conditions; all of these factors have important bearing on the mortality and morbidity of children.

The problem which the child under two years presents is somewhat different from that of the preschool age child (two to six years); whereas in the former group we are more concerned in reducing the death rate, in the latter group our main efforts should be directed to prevent disease and reduce morbidity. However, the problems are practically identical, since the simple hygienic measures which tend to prevent death in babyhood are also the measures which lay the foundations of strong and healthy minds in sound enduring bodies, for those who survive to be our future men and women.

The relation of the problem of the preschool age to the school age is the same as that of prenatal work to the reduction of mortality from congenital causes. The neglect of the preschool age is responsible for the various defects of school children and also for the rejection by the medical examining boards of about one third of all men drafted in the last war. The defects of the school children have their inception in the preschool age; a study of these defects points the way to which our efforts should be directed.

Of 184,374 school children (in New York city) who were examined, twenty-two per cent. were in excellent condition; fifty-nine per cent. in good condition; sixteen per cent. needed medical supervision, and three per cent. needed medical care.

Of those needing medical supervision and care 62.5 per cent. had defective vision; 61.9 per cent. had defective hearing; 45.3 per cent. had defective nasal breathing; 41.5 per cent. had diseased tonsils; 48.3 per cent. had cardiac disease; 72.9 per cent. had pulmonary disease; 38.1 per cent. had orthopedic defects; 50.1 per cent. had nervous affections; 18.3 per cent. had defective teeth, and nineteen per cent. suffered from malnutrition.

MALNUTRITION.

Malnutrition has steadily been increasing in school children. It was present in five per cent. of all children examined in 1914; six per cent. of all children examined in 1915; eleven per cent. of all children examined in 1916; ten per cent. of all children examined in 1917; nineteen per cent. of all children examined in 1918.

Of 1,275 children of preschool age examined at the milk stations, 26.5 per cent. showed various defects.

The school figures include a large number of diseases that never reach hospitals or even dispensaries. From the ordinary medical point, they would be regarded as in the strict sense minor ailments. But in the light of the larger prospective of social efficiency, those ailments are in no sense minor. On the contrary, in the accumulated total they constitute a handicap so serious as often to disqualify the patient from social service of any kind.

INFECTIOUS DISEASES.

Children of preschool age are especially liable to contract all sorts of contagious and infectious diseases; the younger the child, the more likely are these diseases to be followed by bronchopneumonia (especially if confined to hospital). Under two years of age, pertussis causes as many deaths as measles, scarlet and diphtheria combined. How inadequate are our precautions against the spread of pertussis! Children should never be exposed to these contagions (especially children under six years of age), as is often done by ignorant mothers. All children should be subjected to the Schick test and those not immune should be vaccinated with toxin antitoxin (from six months to three years, sixty to seventy per cent. of children are susceptible to diphtheria). Immunization against diphtheria should be as universal as it is against smallpox.

RESPIRATORY DISEASES.

Rickets and consequent thoracic deformities, pertussis, measles and diphtheria predispose children to respiratory affections. Unhygienic surroundings, unsanitary dwellings and hoarding are directly responsible for the spread of respiratory infections to children. The actual cause is an infection from direct contact, through kissing, coughing, sneezing, subways, mothers' handkerchiefs, etc. Every slight cold in a child of tender years should be taken seriously and properly attended to.

To diminish the number of deaths from respiratory diseases, we must encourage proper feeding, proper hygiene, proper clothing and proper attention to bowels; we must remove adenoids and diseased tonsils and avoid unnecessary contact with patients suffering from all infectious and contagious diseases.

DIGESTIVE DISTURBANCES.

These are often the result of improper feeding during the first two years of life; to obviate this, we should always encourage breast feeding and discourage the use of proprietary foods. A quart of milk (to every preschool age child) every day should form the basis of a rational diet. Meat should be reduced to a minimum. Adequate provisions should be made in the diet for the various vitamines, sufficient calories and proper balance.

DENTAL DEFECTS AND ADENOIDS.

Dental decay is caused by the action of bacteria which normally inhabit the mouth. There may be a low resistance of the teeth to decay because of developmental defect (antenatal or postnatal). Faulty diet of mother during pregnancy or of the child after birth may be predisposing causes; but neglect of dental hygiene is usually the immediate cause.

It has been shown that uncorrected dental defects in children may seriously injure the growth and development of the body and greatly lower the child's resistance to communicable diseases. A clean mouth free from sepsis is a prerequisite for the proper growth and development of children. Proper diet and dental hygiene are the answer to dental caries. Wholesale removal of teeth without sufficient reason should be discouraged; teeth (even if only the temporary ones) should be filled rather than extracted when possible.

Adenoids and malocclusion of jaws all seriously interfere with proper nasal respiration. Adenoids predispose to otitis and mastoiditis. Enlarged and diseased tonsils predispose to adenitis and may harbor infectious organisms which may produce systemic diseases, rheumatism, chorea, endocarditis. When present they call for radical removal.

TUBERCULOSIS AND LUES.

All children of tuberculous homes should be removed from the focus of infection; they should be kept at preventoria or day camps. Lues is amenable to treatment. All luetic mothers should be treated before and during conception and the children immediately after birth.

HEART DISEASE.

Acquired heart disease is far more prevalent than is usually supposed in children of preschool age; this usually follows the acute infections and acute articular rheumatism. If every child with the infectious diseases and with tonsillitis and rheumatism were treated as a potential cardiac patient, the prevalence of this condition would be much reduced.

MALNUTRITION.

This is due only in a minor degree to poverty, inheritance, tuberculosis, lues or to other obscure diseases. In the great majority of cases, it is due to adequate causes such as physical defects, improper food habits, overfatigue; and errors of home and school life make the work of correcting malnutrition, though partly medical, for the greater part educational. The most important causes of malnutrition are poor inheritance, improper diet, insufficient sleep, fatigue, the presence of various defects and diseases, poverty, ignorance, lack of parental care and unsanitary schools and homes.

In treating malnutrition we must find and remove the cause; the diet must be corrected; all defects and diseases treated; school lunches, fresh air classes and nutrition classes are general indications. Mental and physical rest and attention to airing, bathing, cleanliness, clothing, sleeping, exercise and home surroundings are essential.

REDUCTION OF MORBIDITY AND MORTALITY.

How can we reduce morbidity and mortality in children of preschool age?

1. Complete registration of births; accurate statistics as to number and distribution of children.

2. Complete physical and mental examination of all children of preschool age, a sort of stock taking.

3. Constant observation, periodical examinations, the supervision of diet and home conditions, the correction of all defects, and the treatment of all diseases. Special health centres and schools should be established.

4. Reliable standards as to height and weight of children of this age must be established.

5. Health education is the fundamental need of the day. Education is the panacea for ignorance. Academic colleges should supply information on health matters to their pupils; school teachers should receive similar instruction. Women should be especially trained for health work. There should be a differentiation of public health nurses. The nurse should treat the sick, the public health worker should teach how to prevent the development of diseases and how to maintain health. All school children should receive elementary instruction in diet and hygiene, and the formation of good health habits should be stimulated. All medical students should receive adequate instruction in diet, hygiene and public health work.

6. Permanent institutional care should be discouraged; all day nurseries and all babies boarded out should be under strict medical supervision.

7. Playgrounds and playcentres should be established (six thousand children die every year from accidents and injuries).

8. Adequate wages, sanitary housing and economical use of incomes are essential requirements.

9. The importance of attending to minor ailments must be emphasized.

10. To reduce morbidity and mortality from infectious diseases, precaution must be taken against the spread of these diseases. The younger the child the worse the prognosis and the more likely it is to have complications, especially if confined in a hospital. Our precautions against pertussis are inadequate. The importance of vaccinating against diphtheria (with toxinantitoxin) those who are not immune, as shown by the Schick test, and against smallpox should be emphasized.

11. To avoid respiratory diseases, hoarding must be avoided, sanitary homes are essential. Rickets, infectious diseases and adenoids predispose to respiratory disease. Direct contact with those infected must be avoided. Therefore, proper feeding, proper hygienic surroundings and proper clothing are essential. Avoid underdressing in winter and overdressing of children in summer. We must remove diseased tonsils and adenoids, and avoid all contact with patients who are suffering from any infection.

12. Digestive disturbances are often the result of improper feeding during the first two years of life. Breast feeding should always be encouraged. A quart of milk every day for every child should be insisted upon as the basis of a rational diet. Meat should be reduced to a minimum; and adequate provisions should be made in the diet for the various vitamines; sufficient amounts of butter, fruits and vegetables should be supplied.

13. The child of tuberculous parents should be removed from the focus of infection (preventoria). The luetic parent should be treated before conception, during pregnancy, and the infant after birth.

14. Cardiac diseases can be reduced by greater attention to the infectious diseases and avoidance and removal of all focal infections in tonsils, teeth, sinuses, appendix, and intestines.

15. In the great majority of cases, malnutrition is due to adequate causes, such as physical defects, improper food habits and overfatigue, and only in a minor degree is it due to poverty, inheritance and other obscure causes.

16. Proper dental hygiene and proper diet are the answer to dental caries. The wholesale removal of teeth in children for inadequate causes should be discouraged; filling, when possible, should be preferred to removal.

17. Diseased tonsils and adenoids should be removed.

18. The deformed (physically and mentally) and the delinquent child should receive special care.

316 West Ninety-fourth Street.

Significant Results Obtained in Treating Catarrhal Deafness*

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Up to the present, little or nothing has been done to relieve the condition of those who are gradually becoming deaf from catarrh. Although this is the commonest kind of deafness most of the methods of treatment have a tendency to hasten rather than to arrest or even retard the progressiveness of the disease.

In my experience with many patients who have been unable to hear anything but the most exaggerated sounds for a number of years and who were gradually growing deaf, I have obtained some significant results. Nearly five years ago, in building up the voice of a singer who had some impairment of hearing, I noticed that in a short time her hearing became normal. At first, I thought this just a bit of good luck; but I decided to investigate the matter further. Since then I have observed that progressive deafness produces a notable change in the quality of the voice and that the pathological conditions existing in the nose, which is an important part of the vocal mechanism, have a direct influence on the auditory mechanism. I have also found that the same course of treatment in the nose which improves the quality of the voice has a remarkable effect upon the hearing of those people suffering from catarrhal deafness. Following are the histories of a few cases:

CASE I.—Miss E. B., aged twelve years, had ever since childhood suffered from catarrh of the nose and throat, hoarseness and a low, nonresonating voice. Her deafness, which was associated with tinnitus, had existed for six years. She had been treated privately and in institutions by the Politzer method of inflation and eustachian tube catheterization. She grew gradually worse under this treatment.

Before Treatment	*After Treatment*
CONVERSATIONAL SPEECH.	
Right ear, 8 inches.	Right ear, 15 feet.
Left ear, 8 inches.	Left ear, 15 feet.
In front of nose, 10 inches.	In front of nose, 25 feet
WHISPERED SPEECH	
Right ear, contact.	Right ear, 1 foot.
Left ear, contact.	Left ear, 1 foot.

After a month's treatment, this child who had been compelled to give up school on account of deafness, returned and graduated with honors. This patient was referred to me nearly five years ago and her hearing today, for all practical purposes, is normal.

CASE II.—Miss N. J., nineteen years old, was referred to me by Dr. Jaugh, of Brooklyn. She had been hard of hearing for over five years and had been troubled a great deal with chronic colds in head and dropping of mucus in back of throat. Her voice was low, hoarse and lacked resonance. Tinnitus was present in both ears and she was not able to hear the conversational speech at the table, the ringing of the telephone or the door bell.

Before Treatment	*After Treatment*
CONVERSATIONAL SPEECH.	
Right ear, 14 inches.	Right ear, 30 feet.
Left ear, 14 inches.	Left ear, 30 feet.
In front of nose, 16 inches.	In front of nose, 40 feet.
WHISPERED SPEECH	
Right ear, 2 inches.	Right ear, 3 feet.
Left ear, 2 inches.	Left ear, 3 feet.

This was nearly five years ago and on inquiring from her and Dr. Jaugh a few days ago they both asserted that her hearing had never given her any trouble since.

CASE III.—P. K., aged thirty-eight years, a soldier in the Philippine Army, had been hard of hearing for over seven years. He was a constant sufferer from colds in the head and mucus dropping in the back of the throat, also marked tinnitus in both ears; voice was very low and lacked resonance.

He had just begun a course in lip reading when he was referred to me by Dr. Olga Neyman, who is a member of the Federal Board for Disabled Soldiers.

Before Treatment	*After Treatment*
CONVERSATIONAL SPEECH.	
Right ear, 2½ feet.	Right ear, 18 feet.
Left ear, negative.	Left ear, 4 feet.
In front of nose, 2 feet.	In front of nose, 20 feet.
WHISPERED SPEECH	
Right ear, 4 inches.	Right ear, 16 inches.
Left ear, negative.	Left ear, 2 inches.

At the present time he has no difficulty in hearing conversation. On Armistice Day he heard every word of President Harding's speech through the amplifier while standing one block away.

CASE V.—B. W., aged sixty-five years, a contractor, had been deaf for thirty-five years. His speaking voice was of very high pitch, and there was marked tinnitus in both ears. He had suffered from frequent colds in the head and constant dropping of mucus in back of throat.

Before Treatment	*After Treatment*
CONVERSATIONAL SPEECH.	
Right ear, 1½ inch.	Right ear, 2½ feet.
Left ear, 1½ inch.	Left ear, 2½ feet.
In front of nose, 1 inch.	In front of nose, 5 feet.
WHISPERED SPEECH	
Right ear, negative.	Right ear, 1 inch.
Left ear, negative.	Left ear, 1 inch.

Of course, this man's hearing is not normal and never will be, but to be able to hear conversational speech at a distance of five feet, having previously been only able to hear it one inch away, certainly seems like a remarkable result.

CASE VI.—Dr. F. H. M., physician and surgeon, thirty-five years old, had been deaf for five years. His voice was low and husky, with little resonance. He had suffered from chronic colds in the head and mucus dropping in back of throat and had worn an acousticon for two years.

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*Read before the Dutchess Putnam Medical Society in Poughkeepsie, N. Y., September 13, 1921

Report of Case IV will appear in author's reprints.

Before Treatment	*After Treatment*
CONVERSATIONAL SPEECH.	
Right ear, 3 feet.	Right ear, 15 feet.
Left ear, 3 feet.	Left ear, 15 feet
In front of nose, 3 feet.	In front of nose, 25 feet.
WHISPERED SPEECH	
Right ear, 4 inches.	Right ear, 1 foot.
Left ear, 4 inches.	Left ear, 1 foot.

CASE VII.—Miss E. M., aged twenty-five years, single, whose hearing impairment had begun at four years of age following measles. Since then she had had a chronic discharge from each ear, frequent colds in the head, and mucus dropping in back of throat. Her speech was very low and difficult for one to hear. Upon examination I found central perforations of each drum with a marked purulent discharge, also marked catarrhal condition in nasopharynx.

Before Treatment	*After Treatment*
CONVERSATIONAL SPEECH.	
Right ear, 27 inches.	Right ear, 22 feet.
Left ear, 29 inches.	Left ear, 22 feet.
In front of nose, 24 inches.	In front of nose. 30 feet.
WHISPERED SPEECH	
Right ear, 4 inches.	Right ear, 40 inches.
Left ear, 5 inches.	Left ear, 25 inches.

The purulent discharge in the right ear has been checked and there is only a very slight discharge from the left ear. The tinnitus has disappeared and her voice is much improved, also the catarrhal condition. This patient was obliged to remain at home previous to my care, but now she is able to go to church and the theater and enjoy the things that people of good hearing enjoy.

CASE VIII.—Mrs. C. W. S., thirty-seven years old, married, with two children, was referred to me by Dr. Edwin Fellows, of Bangor, Me. Her impairment of hearing had existed since childhood and it became so bad that she was obliged to give up her college course at the end of the second year. Her hearing continued to get worse up until the time I saw her. Her voice was very high pitched and muffled. She had suffered from chronic colds in the head and dropping of mucus in back of throat. There was also marked tinnitus in both ears.

Before Treatment	*After Treatment*
CONVERSATIONAL SPEECH.	
Right ear, 19 inches.	Right ear, 25 feet.
Left ear, 22 inches.	Left ear, 25 feet.
In front of nose, 17 inches.	In front of nose, 30 feet.
WHISPERED SPEECH	
Right ear, 1 inch.	Right ear, 50 inches.
Left ear, 3 inches.	Left ear, 55 inches.

The head noises which gave her so much trouble have since the treatment entirely disappeared. Dr. Fellows writes me that she attends church services and the theater and has no difficulty in hearing what is being said. Her voice at the present time is of lower pitch, has a greater richness and a greater carrying power. When one considers the deafness in this case had existed for over twenty-five years, the practical improvement obtained seems to be very unusual.

CASE IX.—Dr. J. G. P., physician and surgeon, forty-seven years old, hearing impairment for over thirty years, marked tinnitus and purulent discharge from right ear, mastoid operation, scar over right ear. He had frequent colds in head, mucus dropping in back of throat and his voice was husky with little resonance. When a medical student at the age of twenty-two, one of our leading ear men removed the malleus and incus from the left middle ear and he had been deaf in that ear for speech ever since. He had had two mastoid operations on the right ear which were unsuccessful, the discharge still continuing. He was unable to gauge the volume and pitch of his own voice.

Before Treatment	*After Treatment*
CONVERSATIONAL SPEECH.	
Right ear, 6 inches.	Right ear, 3 feet.
Left ear, negative.	Left ear, 6 inches.
WHISPERED VOICE.	
Right ear, contact.	Right ear, 2 inches.
Left ear, negative.	Left ear, ½-inch.

He is now able to hear his own voice and consequently can gauge its volume and pitch. The purulent discharge which two mastoid operations failed to clear up has been checked. The noises in the head have disappeared and his whole general condition has very much improved. I report this case to show what can be done for a patient who has had over twenty-five years of treatment, together with three major operations on the ears. The fact that he has regained some hearing in the left ear is most interesting.

These results I have obtained by building up the voice and instructing the patient how to use it properly. It is a known fact that most patients who are deaf fail to use the voice correctly and this has a direct influence in increasing the deafness.

The whole head is a sounding board or resonating chamber, so that when the voice vibrates as it should, we get a better circulation of air in the middle ear, congestion in and around the eustacian tube is diminished, and the ossicles in the middle ear are caused to vibrate and the catarrhal process in the nasopharynx is diminished.

As the nose, throat and mouth are most important parts of the vocal mechanism, it is quite necessary to see that there is no abnormal contact of tissue, for this state of affairs means diminished vibration and resonance. Therefore, under cocaine anesthesia, I endeavor to remove such contact and when this is done there is, as a rule, a notable change in the quality of the voice and also the hearing. The improvement in the hearing in many of these cases is quite spectacular.

After these resonating chambers have been tuned up, I give the patient some voice and reading exercises to stimulate the auditory nerve and its dormant fibres to activity. To bring the voice up into the head cavities I have my patients, two or three times a day for a period of two minutes, sing the vowel E making it decidedly nasal, also a humming exercise on the consonant M in such a way that the lips can be felt vibrating.

The cases that I have reported are only a few of several hundred in which my method of treatment has been successful. I think I am justified in stating after these interesting experiences that practically no one in good health should lose the hearing from a catarrhal process. I am also satisfied that there are thousands of people who are losing their hearing who should not.

Editorial Articles

VITAL INDICES

The search for some simple measure of vitality, of abundance of life, of power and persistence in man's present existence, or whatever we may choose to call it, is a fascinating one. Yet, even as we try to name the thing we are hunting, we become aware that we are in difficulty, for, while such an expression as vital index, or measure of vitality, seems, as we utter it, to be full of meaning, it begins to grow nebulous and fades into mere words when we attempt to explain it.

When we take the matter of length of life or tenacity of existence (of special import to insurance people) the simple comparison of height and weight has long been considered of value as a prognostic guide, though even this is an exceedingly rough and unreliable sort of measure, the underweight or the overweight individual often having his span of years lengthened beyond that of him who seemed to be best proportioned.

The physiologist Hutchinson, some three quarters of a century ago, applied the test of respiratory capacity and found that it was small in the consumptive and, on an average, the amount one can breathe corresponds with the general class of society and occupation to which he belongs. Somehow this test came to be known as that of vital capacity, as if in itself it were the means of measuring the amount of life possessed. But, except with heart disease or tuberculosis—that is, the presence of some serious disease—this measure is not at all satisfactory. It is in no sense a vital index.

With the rise of anthropometry in connection with physical training many attempts were made to juggle the various measurements. A strength-weight index was worked out by Enebuske. A respiratory-height and an organic strength-height coefficient were put forward by Hastings—the former obtained by multiplying the chest expansion by the respiratory capacity and dividing by the height, and the other by multiplying the height-sitting by one half the breadth of waist and multiplying this sum again by the depth of the chest. Truly the measuring of life was getting into deep water, but the end was not yet, for Hastings's final vital coefficient was obtained by multiplying the figures obtained for the respiratory-height index by that for the organic strength-height coefficient. Dr. Dudley Sargent tried his hand at formulating a test, and arrived at one much more complicated.

Recently the search for the index has been renewed, and we have Professor Dreyer's formula, or rather formulæ, based on length of trunk, respiratory capacity, and weight, but complicated by higher mathematics. These indices are interesting and probably get as far as any we have had, but the thing to be measured is as elastic and elusive as ever.

In our attempts at determining the nutritive state of children, we are starting on somewhat the same course of search for a standard, and we are beginning to discover that mere bulk, the mere comparison of weight with height, is too simple an index and guide. It is a rough measuring implement to be used but must be supplemented by every other means that we possess of determining health.

THE PATHOLOGY OF THORACIC WOUNDS OF MODERN WARFARE

Lesions of the thorax due to missiles of modern warfare have now been carefully studied and a glance at the subject as it stands at present will not be devoid of interest. Injury to the ribs has an importance heretofore unsuspected. A single missile may cause multiple fractures of several ribs, particularly when the shots are fired in enfilade. A fracture of a rib or ribs may exist without injury to the pleura, but this is the exception, and in the majority of cases even when the projectile has not entered the pleural cavity the splinters of bone will penetrate the serosa.

This constant association of a costal lesion with one of the pleura should never be overlooked, because when left untreated infection invariably results, and lung lesions properly dealt with like any other visceral trauma will give rise to pleural empyema simply because the costal lesion has been left alone. Not only do the splinters injure the pleura, but they frequently become embedded in the lung as well.

Lesions of the sternum are not frequent, great destruction being very rarely met with, because by the injury of the subjacent mediastinal organs death occurs on the battlefield. Small lesions from exploding shell are nevertheless serious on account of the proximity of the mediastinum, while a sternoclavicular lesion has been known to result in suppurating arthritis of this joint. On the other hand, fractures of the scapula are common and greatly complicate chest wounds. This bone is fragile and its wing, being surrounded by a thick muscular cuff, becomes finely splintered, a condition difficult to deal with properly. And lastly, lesions of the spine and its contents only too frequently occur in chest injuries.

The lesions of the pleura and lung in wounds of the chest are too well known at present to require comment, but we would call attention to injury to the diaphragm which is not uncommon and often accompanied by a wound of some abdominal viscus. Some of the wounds of the diaphragm in thoracic injuries of warfare are really terrific and in spite of their extent the patient recovers after operation. Diaphragmatic wounds situated on the left are interesting because of the rapid tendency to transdiaphragmatic hernia on this side, while the number of cases in which an injured spleen forms a hernia in the thorax is relatively considerable. Finally, a wound of the diaphragm when left unsutured may eventually result in late diaphragmatic hernia.

When pleural suppuration is prolonged ascension of the diaphragm ensues, a fact not generally known but which can be verified by radiography. The muscle presents disseminated areas of sclerosis and will be found very adherent to the lung, following the latter upwards when retraction of the organ occurs. This condition of affairs in thinning of the diaphragm, while the costodiaphragmatic space, even when no suppurative process exists, is frequently adherent following pleuropulmonary wounds. This adhesion takes place at an early date in the process. In one case reported the surgeon was able to see where a biliary fistula had become established opening on the cutaneous surface by passing through the costodiaphragmatic sinus without injecting the pleural cavity.

Thoracoabdominal wounds have been rather frequent and all the viscera of the upper abdomen can be involved, but lesions of the pancreas have been infrequent. The liver, from the severe hemorrhage to which it gives rise when wounded, will increase the volume of the existing hemothorax. A perforated stomach making a hernia into the thorax may empty its septic contents into the pleural cavity and such cases have actually been encountered.

It is remarkable how often a missile will pass through the mediastinum, especially the posterior mediastinum, without involving the esophagus or vessels, but this is fairly common when the anterior mediastinum is perforated by a bullet or other projectile. Nevertheless, numerous cases of missiles embedded in the mediastinum have been recorded and contrary to what might be supposed, cases mediastinitis are rare.

Wounds of the heart have been rarely met with for obvious reasons, while those of the pericardium are frequent. Hemopericardium is occasionally seen. Wounds of the thoracic vessels are also quite exceptional, but we know of at least one case of a wound of the pulmonary artery, while injury to the intrathoracic portion of the esophagus has not been met with clinically.

These pathological data are valuable and interesting, from the viewpoint of both civil and army practice, and have been collected mostly from as yet unpublished documents.

THE WASSERMANN

It may be rank heresy to say so, but we wonder whether the Wassermann test has been of nearly the usefulness, from a practical point of view, as has been thought. Certainly we have overestimated its value in the past and have not always interpreted the test to the best advantage of the patient. History seems to be repeating herself again, substituting Wassermann reaction for tuberculin test, but with the difference that in the former case the machinery is more complicated and indirect. At first a positive tuberculin test meant active tuberculosis. A positive Wassermann has also meant active syphilis or at least syphilis that should be treated. It is being learned, however, that, at least in syphilis of the nervous system, treatment may be harmful rather than helpful.

Just where we are at, or where we should be at, in this matter, is uncertain, but it is evident that we have been led considerably afield in diagnosis by the Wassermann and that we need to be more conservative in our estimates of the test and in our decision to treat the case. J. E. R. McDonough, who has been carrying on some experiments on the reaction, has this to say in a recent *Lancet*. "Though the Wassermann reaction has been extensively employed since 1907 it cannot be said that much progress has been made in unraveling its modus operandi. Some have laid great stress upon the possible interpretation of a positive and negative reaction, but those with a large clinical experience are coming to the conclusion that a negative reaction signifies nothing, and that a positive reaction means no more than the patient has had syphilis. It is now being recognized that the test cannot be used, either as a regulator of treatment or as a test of cure, and that a positive reaction does not necessarily signify that the disease is active and that the patient requires treatment." McDonough may be pushing the pendulum of Wassermann too far in the reactionary direction, but there is need for a conservative estimate of its place in medicine. The fact that new tests for syphilis are being put forward shows that the Wassermann is far from what we expected.

If our estimate of the usefulness of the Wassermann test needs modifying, so does our view of the value of salvarsan. We were wildly optimistic of its effectiveness in its earlier days, and there were very good men who earnestly claimed to see a notable improvement in the patient, the while the magical material was entering the vein. Even if it is a valuable drug, it is not a renewer of damaged tissues and may possibly do harm in some cases as it does good in others.

INTERNATIONAL MENTAL HYGIENE

The May number of *The World's Health*, the monthly review published at Geneva by the League of the Red Cross Societies, contains the following note which will be of interest to mental hygienists:

"The growing interest in mental hygiene apparent of late years and especially since the war, both among doctors and laymen, in many countries, has resulted in the formation of several national societies for promoting mental hygiene. Deriving his inspiration from the work of the National Committee for Mental Hygiene in the United States, Doctor Toulouse founded *La Ligue Francaise d'Hygiène Mentale* in December, 1920. This committee has been very active in the last two years and is now organizing a congress in mental hygiene to be held in Paris next year during the first four days of June. A *Ligue Nationale Belge d'Hygiène Mentale* was founded under the presidency of Doctor Vervaeck on February 12, 1922. Its program is based on the following conception of the problems of mental hygiene: 1, mental diseases; preventable and curable diseases; early treatment in sanatoriums; 2, the abnormal; special classes and institutions for backward children; 3, criminals and delinquents; social measures to be taken; 4, selection of workers in services involving public safety (railways, air service, etc.); 5, selection in the army; 6, selection in industry; 7, selection of colonists; 8, vocational selection in industry; 9, the educational problem; overwork and mental hygiene; 10, social service and mental hygiene; 11, practical methods: central office for mental hygiene; publications, pamphlets, conferences, education of the public, mental hygiene dispensaries. The secretary of the *Ligue Nationale Belge* is M. Dronsart, director of the Central School of Social Service; the central office is to be found at 11, rue de Reinette, Brussels.

"News has recently reached us of the formation of a National Council for Mental Hygiene in Great Britain. The object of the Council will be to encourage those institutions and societies engaged in the promoting of the study of mental disorders, the welfare of the insane, the problems of industrial psychology, and the various aspects of mental deficiency. The council will endeavor to make mental hygiene a recognized subject in the medical curriculum and will help to establish psychological clinics at general hospitals for the treatment of early mental and nervous disorders, and, by instructing the public in the principles underlying mental health, will endeavor to diminish the enormous waste of time and energy resulting from ignorance concerning these questions. A National Committee for Mental Hygiene has been active since 1918 in Canada, while the Swedish Institute of Race Biology is carrying on research which is of vital interest to the whole mental hygiene movement."

SARCOMA OF THE APONEUROSES

The onset of sarcoma of the aponeuroses is slow and silent and usually indolent, but the growth develops rapidly, reaching a considerable size in a short time. Although in some cases it may remain as a small local tumor without giving rise to any symptoms, the onset may be revealed by a partial edema due to venous compression or by pain from pressure on a nerve. The growth, encapsulated in a fibrous shell in the fascia lata for example, will be remote from any vessels, and will present symptoms of a localized growth. If, on the other hand, it arises in the inguinal region or popliteal space it will cause pressure on the vasculonervous elements when it has attained a certain size.

These sarcomata manifest certain physical signs which are rather typical. More or less projecting, according to its size, the tumor can be seen, the surface covered by apparently normal skin, although distended, but dilated veins are sometimes present. These neoplasms push aside the surrounding structures instead of invading them and therefore are movable on the subjacent structures, but they are less so than sarcomata of the subcutaneous cellular tissue. If the growth arises in a strong tense fascia it can only be mobilized with difficulty, especially when the subjacent muscles are made to contract. The functional signs depend upon the site. Pain is uncommon unless some nerve is involved. Sarcoma of the plantar or palmar aponeurosis will give rise to disturbances in walking at an early date in its evolution, but these symptoms are not restricted to sarcoma. The general symptoms should, theoretically, be those of any malignant neoplasm, but sarcoma of the aponeuroses, like other forms, is often without reaction on the general health, and this is all the more likely because it is completely enclosed in a fibrous shell, as is the case with fibrosarcomata.

There is usually a marked leucocytosis, much more so than in cancer, while some observers have noted a decrease in the number of red blood corpuscles. Moreira da Fonseca has noted eosinophilia. Therefore, the evolution of sarcomata of the aponeuroses will be related to their malignancy and to the complications to which they give rise. During the onset, if the growth is small, the only symptom is that of its presence. It is known that sarcomata often arise in the sheaths of the bloodvessels and that the aponeurotic or vascular origin of the growth is often unrecognized when it has passed to the phase of malignancy.

More or less well developed adhesions arise binding the growth to the adjacent vessels and if these are important trunks, excision of the growth is a difficult matter. The lymphatics are rarely involved and although Paccinotti has met with some in the neoplastic tissue the regional lymph nodes are enlarged rather from irritation and inflammation than from secondary invasion of the tumor cells. Enlarged lymph nodes have even been known to disappear after removal of the growth. Metastases occur by the tumor cells carried in the venous circulation so that remote secondary localizations of the growth ensue, preferably in the lungs and pleura, giving rise to dyspnea, bloody expectoration, cough, and all the physical signs of malignant diseases of these structures. The kidneys are also prone to metastases.

The complications belonging to sarcoma itself are the transformations, possible metamorphoses, into more malignant tissue than that of the original tumor. The evolution and prognosis of sarcoma of the aponeuroses can be surmised. The evolution may be excessively slow, but usually growth is rapid.

According to Kirmisson, sarcomata arising in the connective tissue or aponeuroses are to be recognized by their irregular progress, while the prognosis will naturally depend upon the evolution, site and histological structure of the growth. The most frequent histological type is fibrosarcoma and it is also the least malignant.

The treatment is free excision of the growth and mediate and rapidly extending local recurrences are usual.

THE LOOMIS SANATORIUM

The Loomis Sanatorium for the treatment of tuberculosis has recently issued a very handsome monograph in commemoration of the twenty-fifth anniversary of its founding. The publication gives in historical sequence the events of chief interest in the twenty-five years of the life and work of this sanatorium, situated in Sullivan County. The urgent need of a hospital for tuberculous patients of small or no means in proper country surroundings was realized more than twenty-five years ago by Dr. Alfred Lee Loomis, one of the small group of eminent clinicians in this country who became the founders of our present method of treatment of pulmonary tuberculosis. By his enthusiasm he was able to arouse the interest of many in his project, and enough money was collected to rent and rebuild a small house in West Thirty-eighth street, New York. This was the first dispensary in New York for the care of the tuberculous. It was opened in the spring of 1895. This led to further interest and larger donations, making it possible to open the present Loomis Sanatorium at Liberty, New York, on June 1, 1896. Many buildings have been added since that date, and a training school for nurses has been established.

In speaking of future policies of the Sanatorium, the report says: "With an equipment which is fairly complete and efficient, and with methods of treatment well established, it is evident that the further development of the Sanatorium should be characterized not so much, or not at all, by an increase in the number of patients cared for, but by an enlargement of the scope of its work. It seems clear that tuberculosis sanatoria should be able to an exceedingly important degree to further knowledge of the disease, and just as one of their chief functions is properly considered to be educational training of their patients, so the opportunities for instruction should be extended, research work should be stimulated by proper endowment, and sadly needed teaching should be given to senior students of our medical schools and physicians in general practice. Until properly equipped sanatoria are so related to our established centers of medical education as to provide facilities for such instruction, undergraduate and postgraduate, and until the abundant opportunities they offer for research work are more fully used, progress in our knowledge of the disease will be, unfortunately, retarded."

RECENT ACTIVITIES OF THE LIFE EXTENSION INSTITUTE.

In a letter recently addressed to members of the Hygiene Reference Board, the Life Extension Institute outlines its more notable activities of the past year, and announces plans for the future. Among publications by the institute was the book *Waste in Industry,* an investigation of ill health as a cause of industrial waste made on behalf of the Federated American Engineering Societies. The full report of this work has been amplified into a book entitled *Health Building and Life Extension: a Discussion of the Means by Which the Health Span, the Work Span and the Life Span of Man Can Be Extended,* to be published by the Macmillan Company. Another literary contribution to the subject of health has been prepared by Dr. Eugene Lyman Fisk, medical director of the institute, in the form of a volume for the American Viewpoint Series. This volume is intended for readers of seventh grade intelligence particularly for the education of immigrants, school children, industrial workers and the public generally in the practice of hygiene, and gives information about government health organization, federal, State and community. It is planned to arrange a moving picture series presenting the material in this work and making available a film library of simple, fundamental health instruction.

Obituary.

STEPHEN SMITH, M. D.,

of New York.

One of the most famous of New York State's physicians, Dr. Stephen Smith, died on August 26 in Montour Falls, near Elmira, at the home of his daughter, Mrs. Walter C. Mason. Death was due to general debility, resulting from advanced age, for Doctor Smith would have been 100 years old on the 19th of next February.

Stephen Smith was born on a farm in Onondaga County, New York. His father was a cavalry officer in the Revolutionary War. His medical studies were carried on at Geneva, New York, and later at Buffalo, under Dr. Frank Hamilton. He completed his course at the College of Physicians and Surgeons, Columbia University, from which he was graduated in 1850, and was soon afterwards appointed to the medical staff of Bellevue Hospital, where he remained in various capacities for a number of years. He served also in St. Vincent and Columbus Hospitals, and was professor of surgery and anatomy at Bellevue, and professor of clinical surgery at New York University. From 1853 to 1857 he was joint editor of the *New York Journal of Medicine* and from the latter date to 1860, editor. From 1860 to 1864 he served as editor of the New York *Medical Times.* He was the author of *A Handbook of Surgical Operations,* published in 1861; *Principles and Practices of Surgical Operations,* 1879; *The Doctor in Medicine, Who Is Insane,* and *The City That Was,* an account of the shocking health conditions in New York before sanitation became a science.

STEPHEN SMITH, M. D.

Probably the most important work of his life, however, was his service to New York as an official, working for better hygiene and sanitation. In 1864 typhus fever was rampant in New York, and an epidemic of smallpox was raging. In those days no attempts were made to quarantine or segregate cases of infectious or contagious diseases, and conditions became so frightful that a great public uprising in the cause of hygiene took place, which resulted in the formation of a Citizens' Association, with Peter Cooper as head. This organization appointed a council of health and engaged physicians to survey the city with a view to doing away with the horrible conditions of filth, insanitation, and loathsome epidemics. Of this council Doctor Smith was the stay and inspiration, and the report put out by him and his colleagues would now seem incredible. After considering this report, the Citizens' Association instructed Doctor Smith, in cooperation with one of the city's ablest attorneys, to draw up a law creating a Metropolitan Health Department. After much opposition on the part of political gangs and job holders, and in the face of other obstacles, this law was passed at Albany, and Dr. Smith was appointed by Governor Fenton Commissioner of the Metropolitan Board of Health.

When the National Board of Health was instituted in 1879, President Hayes made him one of the first members. In 1880 Doctor Smith drafted and secured the passage of the bill creating the New York State Board of Health. He was made a member of the New York State Board of Charities in 1881, an office he resigned the following year in order to accept that of State Commissioner of Lunacy. He remained in this office for six years and was the means of bringing about great reforms in the care and treatment of the mentally diseased. It was one of his cherished ideas that all the insane should receive State care, and the law to that effect was proposed, and drafted by him. This law was enacted in 1887. Governor Flower, in 1893, reappointed him to the State Board of Charities, and he was retained in this office by Governor Black. In 1894 he was sent by President Cleveland to France as a delegate to the Ninth International Sanitary Conference. It was through his influence and efforts that the American Public Health Association was founded in 1872, and he was its first president. Another one of Doctor Smith's notable services to the medical profession was the introduction of trained nurses into hospitals and into the work of caring for the sick in general.

Doctor Smith was not only a man of exceptional intellectual and scientific ability, he possessed also unusual physical health and vigor, coupled with a rare charm of personality. His last public appearance was in June, when he was awarded the degree of Doctor of Science by Columbia University. In the preceding November he was guest of honor at the semicentennial celebration of the American Public Health Association at a dinner at the Astor. Upon this occasion he was presented with a gold medal in commemoration of his numerous and valuable public services.

It is of great interest to recall that, at the time of Doctor Smith's graduation, 1850, there did not exist anywhere in this country a single organization for public health and sanitation. New York city was totally devoid of hygienic measures of any kind, and had a death rate of more than thirty-five to the thousand. Doctor Smith left it with one of the most efficient sanitary systems in the world, and with a death rate of twelve or thirteen, and in rare instances as low as eight.

Wherever sanitation and better health condition will be discussed Dr. Smith will remain a symbol o a man with vision who lived to see a day when hi dreams and labors bore fruit.

News Items.

Wesley M. Carpenter Lecture.—Dr. Raeffele Bastianelli, of Rome, Italy, delivered the Wesley M. Carpenter lecture, Thursday evening, October 5th, at the New York Academy of Medicine.

Chair in Military Tactics and Science at Medical College of Virginia.—A course in military tactics and science has been established at the Medical College of Virginia and Dr. Charles Wallace Sale, Major Medical Corps, United States Army, has been appointed to the professorship.

New York City's Low Death Rate.—According to statistics of the department of health the death rate in the city for the week ending September 30th was the lowest on record, being only 8 in 1,000. During the month of September the total deaths numbered 4,218, compared with 4,442 during the same period last year.

American Physicians Honored by Armenians.—Four American physicians have been made honorary members of the Armenian Medical Society in recognition of their work in Near East Relief. They are: Dr. Elsie Graff, of Vassar College; Dr. Mabel E. Elliott, of Benton Harbor, Mich.; Dr. Roland P. Blythe, of Cranford, N. J., and Dr. Russell T. Uhls, of Kansas City.

Postgraduate Course in Medicine and Surgery at the University of Buffalo.—At the opening of the Postgraduate Course in Medicine and Surgery, recently inaugurated at the University of Buffalo, Dr. Smith Ely Jelliffe, of New York, gave two addresses, one on Psychopathology and Organic Disease, and the other on Dynamics of the Psychical Mechanisms in the Production of Socalled Neuroses. There was a very large attendance.

Pasteur Centennial.—The Library Committee of the New York Academy of Medicine has issued an urgent appeal to members and others to lend Pasteur memorabilia, such as letters, manuscripts, engravings or pictures of any kind having to do with the life work of Pasteur. These will be used by the academy in the celebration of the Pasteur centennial, to be held at the Academy December 27, 1922, to January 10, 1923.

Foundation Day Exercises of Kings County Medical Society.—The Medical Society of the County of Kings held exercises on Saturday, October 7th, at the MacNaughton Auditorium, Library Building, Brooklyn, to commemorate the founding of the society in 1822. Dr. Lewis P. Addoms read the minutes of the first meetings of the society and addresses were delivered by Dr. Royal S. Copeland, Dr. Nicholas Murray Butler, and others.

American Association of Obstetricians, Gynecologists, and Abdominal Surgeons.—Dr. Gordon K. Dickinson, of Jersey City, was elected president of this association at the thirty-fifth annual meeting held in Albany, N. Y., September 19th to 21st. Other officers were elected as follows: Dr. George V. Brown, of Detroit, first vice-president; Dr. James A. Harrar, of New York, second vice-president; Dr. William G. Dice, of Toledo, treasurer; Dr. James E. Davis, of Detroit, secretary. The next annual meeting will be held in Philadelphia, September 19 to 21, 1923.

New Physicians' and Surgeons' Building.—The new physicians' and surgeons' building at 3 to 5 East Fifty-third Street, is now ready for occupancy. The building is of the most modern construction and equipped with all the latest improvements. It is seven stories in height and there are four complete suites on each floor consisting of waiting room, office, examination room, lavatory and dressing room. A trained staff of efficient attendants on each floor will be at the service of the physician.

Personal.—Dr. Edward A. Sharp, of Buffalo, has been appointed professor of neurology in the University of Buffalo, to succeed Dr. J. J. Putnam, who resigned recently.

Dr. Arthur I. Blau, who has been a diagnostician in the New York City Department of Health for several years, is leaving for Vienna and Berlin for postgraduate studies in pediatrics, and on his return in the summer of 1923 he will limit his practice to that specialty.

Dr. Fred H. Albee, of New York, opened the discussion on bone graft surgery at the Medical and Surgical Congress of France, held in Paris, October 2d to 7th.

Dr. Adolf Lorenz has returned from Vienna and expects to remain in this country until next spring.

French Doctor to Be Tried for False Diagnosis.—According to press dispatches from Paris dated October 6th, the magistrates' court at Evreux, France, has ordered the trial of Dr. Vallet on the charge of causing the death of a patient through erroneous diagnosis. It is said that Dr. Vallet recently operated on a woman for a fibroid tumor and the operation disclosed the fact that the woman was pregnant. A correctional operation was done immediately and the child was saved but the woman died. Dr. Louis Dartigues, vice-president of the Society of Medicine of Paris, who was called as a witness, expressed his indignation at the decision of the provincial courts, asking by what right infallibility was demanded of the medical profession and not of other professions.

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Died.

Banta.—In Buffalo, N. Y., on Friday, September 22nd, Dr. Charles Woodbury Banta, aged forty-four years.

Church.—In Greeley, Colo., on Monday, September 11th, Dr. Walter Fremont Church, aged fifty-seven years.

Fremont-Smith.—In Bar Harbor, Me., on Friday, September 29th, Dr. F. Fremont-Smith, aged sixty-six years.

Groszmann.—In Plainfield, N. J., on Monday, October 2nd, Dr. Maximilian P. E. Groszmann, aged sixty-seven years.

Hatzel.—In New York, on Tuesday, October 3rd, Dr. George Grover Hatzel, aged thirty-eight years.

Ingalls.—In Brooklyn, on Wednesday, September 27th, Dr. James Warren Ingalls, aged seventy-two years.

Johnson.—In New York, on Friday, October 6th, Dr. John Douglas Johnson, aged sixty-two years.

Locke.—In Syracuse, N. Y., on Friday, October 6th, Dr. Hersey Goodwin Locke, aged fifty-nine years.

Shine.—In Neuilly, France, on Friday, September 8th, Dr. Francis Eppes Shine, of Los Angeles, Cal., aged fifty-one years.

Storer.—In Newport, R. I., on Monday, September 18th, Dr. Horatio Robinson Storer, aged ninety-two years.

Winters.—In Boston, on Wednesday, October 4th, Dr. Joseph E. Winters, aged seventy-four years.

LONDON LETTER.

(*From our own Correspondent.*)

London, September 8, 1922.

Address of the President and Others at the Meeting of the British Association for the Advancement of Science—Intestinal Stasis and Insanity.

The meeting of the British Association for the Advancement of Science is now being held in Hull, Yorkshire. At the inaugural meeting, which took place on September 6th, a large number of distinguished foreign representatives were present, including Dr. E. B. Matthews, representing the American Association for the Advancement of Science. The new president, Sir Charles Sherrington, professor of physiology in the University of Oxford, and also the president of the Royal Society of Medicine, delivered the inaugural address, which was entitled Some Aspects of Animal Mechanism. He said in part that our own body is full of exquisite mechanism. There is that by which the blood is kept relatively constant in its chemical reaction, despite the variety of the food replenishing it and the fluctuating draft from and inpouring into it. The kidney cells and the lung cells form two of the main submechanisms. One part of the latter is the delicate mechanism linking the condition of the air at the bottom of the lungs with the part of the nervous system which manages their ventilation. The adjustment is so delicate that the very slightest increase in the pressure of carbonic acid at the bottom of the lungs at once suitably increases the ventilation of the chest. All this regulation, although the nervous system takes part in it, is a mechanism outside our consciousness. Part of it is operated chemically; part of it is a reflex reaction to a stimulus of a mechanical kind, though as such unperceived.

Perhaps that portion of the address which dealt with the regeneration of the nerves was of the greatest interest to the medical man. It was pointed out that for some aspects of nervous mechanism the nerve impulse offers little or no clue. The fibres of nerve trunks are perhaps of all nerve structures those that are best known. They constitute the motor nerves of muscle and the sensory nerves of the skin. When they are broken the muscle or skin is paralyzed. They establish their ties with muscle and skin during embryonic life, and show no further growth. If severed, say by a wound, they die for their whole length lies between the point of severance and the muscle or skin they go to, and then at once the cut end of the nerve fibres start regrowing from the point of severance, although for years they have given no sign of growth. The fibre, so to say, tries to grow out to reach to its old far distant muscle. There are difficulties in its way. A multitude of nonnervous repair cells growing in the wound spin scar tissue across the new fibre's path. Between these alien cells the new nerve fibre thread a tortuous way, avoiding and never joining any of them. This obstruction it may take many days to traverse. Then it reaches a region where the sheath cells of the old dead nerve fibre lie altered beyond ordinary recognition. But the growing fibre recognizes them. Tunneling through endless chains of these cells, it arrives finally, after weeks or months, at the wasted muscle fibres, which seem to have been its goal, for it connects with them at once. It pierces their covering membranes and reforms with their substance junctions of characteristic pattern resembling the original that had died weeks or months before. Then its growth ceases, abruptly as it began, and the wasted muscle recovers and the lost function is restored. In his address Sir Charles Sherrington made almost a romance of physiology, or at least he lifted it out of a dry as dust groove.

In the section of anthropology its president, Mr. H. J. E. Peake, gave an address on the study of mankind. He said, in part, that anthropology was to be defined as the study of the origin and evolution of man and his works, but it must be realized that the works of men's brains were as important, even more important, than the works of their hands. The study of backward people had still great value, but anthropologists should not concentrate exclusively on these lowly cultures. They were giving up the belief that such people were human fossils which had preserved their ancestral types to the present day. The time had come when more attention should be paid to the conditions of more highly civilized people, and especially to the civilizations of China and the Far East, of Hindustan and the European area.

In the section of physiology, Professor A. V. Hill gave an address on athletics and oxygen supply. He set out to demonstrate that the relation between distance and speed in running was largely a question of the rate as which a man could use oxygen to be absorbed after the exertion. He showed how a man might have a very small heart and yet run a hundred yards very well, whereas a mile champion would need to have a strong heart. The methods used to run a short distance would fail when applied to a long distance. Professor Hill said that his own tests had revealed that during twenty seconds' severe exercise practically no oxygen at all was used, but after the exercise he might use five and a half litres over the normal. A man running half a mile would use four litres of oxygen during the exercise and four litres afterwards. In running twenty miles three hundred litres would be used. If it were not for the fact that an athlete could take credit for oxygen to be used after exertion severe exercise would not be possible. The capacity for absorption was about four litres a minute, but the muscles acted in the same way as a lead accumulator and stored energy which could be called upon and restored later by recharging.

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Medical men seem to be becoming more alive to the dangers inherent in chronic intestinal stasis. Sir Arbuthnot Lane was the first in this country to call attention to the menace of long continued intestinal stasis, with its sequential alimentary toxemia. He has traced a long list of diseases and deviations from normal health from neglect to prevent this condition from gaining a firm foothold or failure to use effective treatment in time. Dr. Ford Robertson has been investigating into the causes of dementia præcox in the pathological laboratory of the Scottish asylums and especially with reference to its possible relationship to intestinal stasis. Dr. Robertson has carried his researches sufficiently far to state with conviction that the source of the origin of this most frequent form of mental aberration is in the first instance due to intestinal toxemia, and he expresses the definite opinion that by arresting this condition in the early stages of dementia præcox the disease may be cured. Whether further investigations will bear out this view remains to be seen, but at any rate, Dr. Robertson's conclusions add weight to the argument that mental diseases, at least some forms, are as amenable to treatment in their early stages as are physical diseases.

BALKAN LETTER.

Vienna, September 18, 1922.

BUBONIC PLAGUE AT ODESSA.

Bubonic plague, believed to have been imported by rats from a foreign vessel arriving at the docks, has been discovered in a tenement in Odessa (Ukrainia, Southern Russia). One man, a laborer, has died, and his wife and two children are suffering from the disease. The diagnosis has been confirmed by the city medical health officer and the municipal bacteriologist, both of whom had considerable experience with the disease in an outbreak which took place in Odessa during the war, so that there can be no doubt that the Odessa authorities are just now confronted with this most formidable disease. Energetic measures are being taken, an extra staff having been engaged by the public health department, including two medical men, whose duty it will be to keep a special watch on families in the neighborhood of the tenement in which the disease appeared. It is thought that some infected rats were concealed in a quantity of rags imported from the East. The three persons affected have been isolated in the city hospital, and at present only one of them is regarded as being seriously ill. The fact that the disease has broken out in one of the poorest parts of the town increases the likelihood that some fresh cases may arise before the disease is finally stamped out.

MEDICINE AMONG THE ARABS.

A Vienna doctor, who has held an important medical position in Palestine for over fifteen years, describes the special features of medicine among that ancient people. The Arab has a great respect for the medical science of the *roumi* (Christian), for the curative art as practised by the natives is in great measure a matter of faith and the greater the sanctity of the doctor the better are his results. It must not be imagined that Arab doctors are all ignorant quacks whose hold on the confidence of the people is based exclusively on the Arab equivalent for Christian science. There are native schools of medicine where students repair for instruction and are austerely maintained out of the public funds. At the termination of their studies, which consist principally of committing to memory passages from the *Koran* bearing on hygiene and in assimilating oral tradition, they then pass a sort of examination and are accorded a diploma in which it is set forth that the candidate is acquainted with "the certain sciences," such as the study of the four elements, and possesses a knowledge of the properties of drugs "for the purpose of producing violent or moderate effects." He is further certified to know the medicinal plants, under what circumstances to gather, and at what hour and in what way to administer them—which is possibly more than could be truthfully said of many young graduates of more civilized countries. He has learned the names of the bloodvessels and muscles "together with many other branches too numerous to be enumerated." In a country where every adult male who can afford it has three or four wives, it will readily be understood that the preparation of aphrodisiacs is an important source of income, and numerous are the prescriptions vaunted for the cure of the *beurd* (impotence). Organotherapy, which fell out of favor in Europe toward the end of the eighteenth century, is still in great repute among the Arabs and many tissues and secretions are employed therapeutically.

To save trouble in arriving at a diagnosis, the Arabs have recourse to a rule of thumb calculation based on the existence of four temperaments, corresponding to the four elements. To know the constitution of a patient all that is necessary to do is to add together the letters of his name and that of his mother and divide by seven. The result indicates the star under which he was born, and, dividing the number by four, the patient falls into one or other of the four categories—fire, earth, air, or water. The appropriate treatment is then merely a matter of routine aided by memory. The fees are remarkably moderate, the average payment for a consultation, including medicine, being from two to four *flous* (a *flou* is the sixteenth part of a cent), but if the physician rejoices in an unusual reputation for sanctity the honorarium may be increased *ad valorem*. What we may call cosmetic medicine is an important branch of the art in Mohammedan countries. Recipes abound for removing freckles and several effectual epilatories are known; for instance, a paste composed of quicklime, orpiment and soft soap; another especially recommended is a mixture of nitre and ants' eggs (formic acid). Obesity is regarded as a quality instead of, as with us, a quasi-deformity, and to determine the production of fat, women swallow pills of arsenic and stuff themselves with bread crumbs and fenugreek, a leguminose with aromatic seeds. Perfumes of all kinds are greatly esteemed, both as cosmetics and therapeutically. A compendium of herbs, plants, and drugs used by the Arabs was issued by Dr. Alfred Gubb, an English physician who practised among Arabs for over twenty years. Their views on gestation are peculiar. Among other oddities it is universally believed that a fetus may "go to sleep," that is to say, may cease to grow for a time so that an Arab husband sees nothing extraordinary in his wife having given birth to a child after a year or two's absence. They do not divide the umbilical cord until the placenta has been expelled and the fetal end of the cord is charred in a candle flame. They attach great importance to the support of the perineum by means of a rolled up towel, and an aromatic plaster is applied to the vulva after delivery. A belly band is applied for three days and the parturient is allowed to get up on the fourth or fifth day.

Book Reviews

INTESTINAL OCCLUSIONS.

Les Occlusions aigues et subaigues de l'intestin. Clinique, Expérimentation, Therapeutique. Par A. C. GUILLAUME. Avec figures et schemas dans le texte. Paris: Masson et Cie, 1922. Pp. 304.

Guillaume understands intestinal occlusion to mean a complete stoppage in the course of the intestinal current, accompanied by permanent and persistant symptoms. The book contains the following chapters: 1. Anatomy of Occlusion. 2. The Clinic of Intestinal Occlusion. 3. Prognosis. 4. Diagnosis of Ileus. 5. Pathology. 6. Treatment. The author divides the treatment into medical and surgical procedures. Among the medical means the author praises the electric enema, atropine, morphine, pilocarpine, eserine and pituitary extract. Among the surgical procedures two methods are described: 1, Enterostomy through a direct lateral opening of the abdomen; 2, laparotomy and removal of the obstacle. The book is well written and practical.

PEPTIC ULCERS.

Les Ulcères digestifs. Par PAUL CARNOT, PAUL HARVIER, PAUL MATHIEU. Paris: J. B. Baillière et Fils, 1922. Pp. 159.

This monograph on peptic ulcers is a very valuable addition to medical literature. Harvier points out the great difficulties encountered in making a differential diagnosis between pyloric or duodenal ulcer and gallbladder lesions. Pains late after meals, characteristic of duodenal ulcer, are found in the same way in gallbladder lesions, especially if there are adhesions between the gallbladder and duodenum. In the treatment of peptic ulcers Carnot speaks highly of a milk diet. He usually adds to the milk sodium citrate in the proportion of one to two hundred and fifty. This has the advantage of preventing the coagulation of milk in big lumps and acting at the same time as a neutralizing agent. In cases of gastric hemorrhage, however, sodium citrate should not be given, as it favors bleeding. Mathieu discussing the surgery of peptic ulcer is a great advocate of excision of the ulcerated area. He makes use frequently of Péan's, Pólya's, and Billroth's gastropylorectomy operations. The entire subject is treated in a practical and masterly manner.

LABORATORY TECHNIC.

Laboratory Technic. The Methods Employed at St. Luke's Hospital. By F. C. WOOD, M.D., KARL M. VOGEL, M.D., and L. W. FAMULENER, M.D. Second Edition. New York: James T. Dougherty, 1922.

To those who adopted the first edition of this practical manual as a necessary part of their laboratory equipment, the news of its revision and enlargement is indeed welcome. In these days of ceaseless activity on the part of research workers, when new methods of blood analysis appear in the journals every month, the number of technical procedures and modifications of the original methods is bewildering. For the routine worker in a hospital or commercial laboratory such a book as this one is indispensable, presenting as it does, in a clear and concise manner, only those methods which have been tried and found satisfactory, and which give results that the clinician can rely upon. Since 1917, when this book originally appeared, many additions have been made to the resources of the bacteriologist and clinical pathologist, and the present edition reflects this activity in the laboratory sciences by its increased bulk. A considerable part of the text has been entirely reset, so that with the revision and the additions of new methods it has been thoroughly brought up to date. The volume can be unhesitatingly recommended to the laboratory worker in search of a *vade-mecum.*

LIPOIDS.

Zur Biologie der Lipoide. Mit Besonderer Berucksichtigung ihrer Antigenwirkung. Von Privatdozent DR. HANS SCHMIDT, Hamburg. Leipzig: Curt Kabitzsch, 1922.

The importance of lipoids in the analysis of cellular processes is second only to that of the colloids, and the two are closely related. From a practical standpoint renewed interest was awakened in lipoid chemistry when it was found that the Wassermann reaction depended upon the presence of lipoid substances in the blood. A close relationship between lipoids and the antitryptic power of the serum, by which Jobling and Peterson have explained the action of iodides in causing the resorption of gummata, is another interesting phase. It is convenient to have in accessible form a résumé of the modern investigations on the biological side of lipoid activity, and the small volume under review gives an excellent survey of the question, with a bibliography including articles on the subject up to 1921. Those engaged in serology will find much in it to interest them.

COLLOIDS.

The Formation of Colloids. By THE SVEDBERG. Professor of Physical Chemistry in the University of Upsala. With 22 illustrations. New York: D. Van Nostrand Company, 1922. Pp. viii-127.

It is the growing opinion of biological chemists that the next ten years will see the colloidal aspects of the subject playing a very much more important part than it has in the past. The cells of the body are all made up of substances in various colloidal states. The whole question of osmosis, of edema, and of inflammation, hinges upon colloidal changes in the cells. Even the phenomena of anaphylaxis, infection, and complement fixation seem to bear closer relationships to our present notions of colloidal chemistry than to the old fashioned biological variety which was content to work on dead cells by methods of analysis which often seriously altered the substances for which they were searching. Colloidal chemistry, on the other hand, tries to approach the solution of its problems by the study of the living cell, or by investigating the effects of changes on inert colloidal material to obtain an insight into similar alterations going on in the living cell. The splendid work of Jacques Loeb on proteins in the colloidal state is an example of the present trend of investigation. There have been few books in English which give an adequate treatment of the subject, and it is a pleasure to welcome this excellent introduction to colloid chemistry with illustrations drawn largely from inorganic colloids, the investigation of whose physical and chemical qualities has necessarily preceded our study of the very much more complex organic colloids of the cells.

BACTERIOLOGY.

Aids to Bacteriology. Students' Aids Series. By WILLIAM PARTRIDGE, F.I.C. Fourth Edition. New York: William Wood & Co., 1922.

Bacteriology. For Students in General and Household Science. By ESTELLE D. BUCHANAN, M.S., recently Assistant Professor of Botany, Iowa State College; and Robert Earle Buchanan, Ph.D., Professor of Bacteriology, Iowa State College, and Bacteriologist of The Iowa Agricultural Experiment Station. Revised Edition. New York: The MacMillan Company, 1921. Pp. xvii-560.

Evidence as to the popularity of these aids to the bacteriologist lies in the fact that Partridge's *Aids to Bacteriology* now appears in its fourth edition. Its form is so compact that it resembles the pocket classic style of volume, and it may be readily carried around for perusal in the subway.

An interesting inclusion in Chapter X, on Microorganisms of Suppuration and Septic Diseases, is that of Diplococcus rheumaticus. The right of the socalled Diplococcus rheumaticus to a separate place in the classification of streptococci must be regarded as an open question, for such standard texts as Park and Williams, and Kendall fail to mention it. Jordan states that "it is possible that Streptococcus (or Diplococcus) rheumaticus will eventually come to be regarded as an independent species. . . . For the present the question of the specificity of the streptococcus found in rheumatism may be regarded as unsettled."

The statement on page 143 that "antipneumonic serum has not given very satisfactory results (in pneumonia)" is at least open to challenge. The extent to which antipneumococcus serum in pneumonia has been used in England is, of course, not so great as its use in this country, but a countryman of Partridge's, Archibald Malloch (*Quarterly Journal of Medicine,* 1922, January, No. 58) states that "at least one third of all the lobar cases in this country [England] are due to Type I, in which group specific antiserum has proved of benefit elsewhere." Such an unquestionable authority as Sir William Osler, in the ninth edition of his *Principles and Practice of Medicine,* in writing of antipneumococcic serum in pneumonia, affirms that "the value of this method of treatment is established for Type I." Park and Williams state that the mortality up to the present time in treated cases of Type I pneumonia has been much less than in the untreated. Numerous other references might be quoted in support of the value of antipneumonic serum in the treatment of Type I pneumonia. On the same page one reads that "mice may play an active part in the dissemination of pneumonia, particularly the epidemic variety (Gamaleia)." The numerous studies which have appeared in the last few years on the epidemiology of pneumonia do not seem to bear out this opinion.

For so small a book a surprising amount of ground is covered. There are sections on the bacteriology of plants, sewage, shellfish, meat, soil, air, milk, and water, and the last chapter is devoted to a discussion of disinfection and disinfectants.

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Bacteriology is divided into five sections: morphology, classification, and distribution of microorganisms; cultivation and observation of microorganisms; physiology of microorganisms; fermentation or zymotechnique; and microorganisms and health. As the book is designed especially for the use of students in general and household science, it is natural that the chapters on the yeasts and molds, and that part of the book dealing with fermentations, should be more fully dealt with than one usually finds in bacteriological texts whose interest is focussed on microorganisms and their relations to health and disease. Those who are occupied in the constantly broadening field of household science will be particularly interested in the chapters on food preservation, alcoholic fermentations, lactic acid fermentation, and acetic acid fermentation, the ripening of meats and cheese, and the contamination and examination of air, milk, and water.

OTOLOGY.

Diagnostik und Therapie der Ohrenkrankheiten. VON DR. CONRAD STEIN, Privatdozent der Ohrenheilkunde an der Wiener Universität. Bonn. A. Marcus & E. Weber's Verlag, 1922.

This little volume, which is subtitled a handbook for the general practitioner, is intended to replace, or, rather, to supplement the didactic lectures on otology and the courses in the use of the otoscope. The diagnostic part takes up the symptoms and signs of otitic disease, such as pain, otorrhea, deafness, tinnitus, nystagmus and vertigo, considering the causes, pathology, and general treatment in each case. The chapters on therapeutics deal with the treatment of earache, discharge, and deafness, with general directions and indications for the more usual otiatric operations.

GLAUCOMA.

A Treatise on Glaucoma. By ROBERT HENRY ELLIOT, M.D., B.S. (Lond.), Sc.D. (Edin.), F.R.C.S. (Eng.) With 213 Illustrations and Frontispiece. New York: Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1922. Pp. xxii-656.

The popularity of this work is well attested by the appearance of a second edition within the space of four years. It is an up to date presentation of all we know of that mysterious disease glaucoma—a collective name for a group of pathological conditions whose chief characteristic is an increase of intraocular pressure. The subject is gone into in that thorough and conscientious manner for which the author is so well known, both in his writings and his practical operative work. The practising ophthalmologist will find in it the very latest word on the theories of glaucoma, and on the etiology, diagnosis, and medical and surgical treatment of the various glaucomatous states: indeed we are not aware of the existence of any textbook or encyclopedia in which the subject of glaucoma is treated so extensively and so authoritatively. This work should also appeal to the general practitioner who is frequently the first to be consulted by the patient with an oncoming glaucoma, with indefinite symptoms not directly traceable to the eye. There are, in fact, many eyes lost from glaucoma because of neglect or wrong treatment in the incipient stages of the affection. Many a practitioner might indeed imitate "a well known London physician who kept pasted above his shaving glass a short list of signs and symptoms of glaucoma in order that he might not fail to diagnose such a case if he met with it in his practice" (p. 151). We might add, *en passant,* that the author's English is a marvel in its simplicity of exposition, its conciseness of expression, and lucidity of style.

CLINICAL DIAGNOSIS.

Clinical Diagnosis. Case Examination and the Analysis of Symptoms. By Alfred Martinet, M.D. Paris, France. With collaboration of Drs. Desfosses, G. Laurens, Leon Meunier, Lutier, Saint-Cene *and* Terson. Authorized English Translation from the Third, Revised and Enlarged Edition, by Louis T. de M. Sajous, B.S., M.D., Philadelphia. With 895 Text Engravings and Several Full Page Color Plates. Complete in Two Royal Octavo Volumes. Vol. I.: Physical and Laboratory Diagnosis. Vol. II.: Analysis of Symptoms. Philadelphia: F. A. Davis Company, 1922. Pp. xix-1388.

These two volumes should prove of great value to the general practitioner, as many aids to diagnosis and useful hints on the avoidance of error are presented. The plan followed is that of a consideration of the various organs and systems and a final correlation embodying deductions. Clinical diagnosis is a fine art as yet not perfected, and any help we can obtain from books of this character should be made use of. And a better translator for this important work could not be found than Dr. Louis T. de M. Sajous, for he is thoroughly conversant with both French medical literature and American methods.

PASTEUR.

Pasteur and His Work. By L. Descour. Translated by A. F. and B. H. Wedd, M.D. Second Edition. New York: Frederick A. Stokes Company, 1922. P. 256.

Louis Pasteur was born on December 17, 1822. No feature of a centenary celebration could be more fitting than the publication of the second edition of M. Descour's splendid life of this great master of the laboratory. This biography is significant, not only as a vivid picture of the daily life of Pasteur, but is also a character study, and a history of some of the most important scientific discoveries of the nineteenth century. His career is traced from childhood, through the Ecole Normale, where he began his studies of molecular dyssymmetries; through his professorship at Lille, where his researches led to the discovery of the laws of fermentation and the recognition of the real nature of ferments; the study of ferments led him to the discovery of aerobes, leading in turn to the complete understanding and explanation of the dissolution of organic matter; the same study of ferments led to the discovery of the cause and the prevention of silk worm disease, which was ruining sericulture in France, and to useful application of the knowledge thus gained to human pathology. Pasteur studied successively anthrax, the vibrion septique, the microbes of osteomyelitis and of puerperal infection, chicken cholera and its microbes, and vaccination, inaugurating a new era in medicine and the conquest of anthrax, rouget and rabies. This last victory raised Pasteur to the highest pinnacle of fame, a position which he has kept in the history of medicine. The chapter in the biography on the discovery of the treatment of rabies, and of the first cases brought to the Pasteur laboratory for treatment for this frightful affliction, are more thrilling reading than most fiction. In fact, the style of the whole book is marked by vivid narration and refreshing vigor of expression.

QUEEN ELIZABETH.

The Private Character of Queen Elizabeth. By Frederick Chamberlin, LL.B., M.R.I., F.R.H.S., F.S.A., F.R.G.S., F.R.S.A., Author of The Philippine Problem. With Eight Illustrations and Numerous Facsimiles. New York: Dodd, Mead & Co. London: John Lane, The Bodley Head Limited, 1922. Pp. xxi-334.

With some 320 pages of documentary evidence, Chamberlin draws us to the conclusion that Queen Elizabeth's reputed physical vigor and immorality must be laid to tradition and not to fact. The history of her days becomes a record of ailments, her foreign and domestic policies a cross examination of the opinions held currently about her. Chamberlain shows the political background of the scandal rumors. He has brought to light valuable contemporary documents, and has explained satisfactorily how they came to be suppressed, while garbled rumors were sown broadcast. The report of well known modern physicians on the health record of Elizabeth which Chamberlin has drawn up is significant, confirming in scientific terms what he tries to make clear to the lay mind. Given a wider scope of intimate material of this sort, and the knowledge drawn from present day studies of psychopathology, what a truly wonderful life of Elizabeth might be written! Chamberlin's life is incomplete, his discoveries throwing the rest of Elizabeth's important history out of drawing. We fear that the book must be damned by the noncommittal "interesting." It will make a good stepping stone for the great writer.

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Medicoliterary Notes.

The earliest child welfare movement on record is credited to the ancient Romans. This consisted in the foundation, by the Emperor Trajan, of a public appropriation for abandoned infants. The funds for this purpose were procured in the most businesslike manner, sums of money being lent to landowners for the development of their estates and the interest on such loans applied to the financing of the infant welfare scheme. Even Nero is reputed to have given the question a good deal of earnest consideration, without, however, any tangible results. —*World's Health.*

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Many of the readers of Walter de la Mare's *Memoirs of a Midget,* who found it one of the most suggestive and artistically presented psychological studies in fiction form of recent years, will be interested in the rather original and unusual interpretation given to the novel by John Freeman in an article on De la Mare in the July *Quarterly Review.* Freeman believes that the author "did not want to prove anything, certainly not anything desperate, bitter, relaxing, and hence it seems that the melancholy frustration and the mere insistent painfulness are not an involuntary utterance of unhappiness with which Mr. de la Mare, stung by a sense of the irreconcilable, has contemplated life in ruins—life of which all the beauty and energy have dwindled into a simple making the best of a bad job.

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An important contribution to the subject of industrial medicine is The Treatment of Carbon Monoxide Poisoning, by R. R. Sayers and H. R. O'Brien, both of the United States Public Health Service. The pamphlet is issued as Reprint 728, *Public Health Reports.*

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Henry Pratt Fairchild, of the Bureau of Community Service and Research, New York University, writing in the *Yale Review* for July on The End of Race Migration states his reasons for discouraging further immigration.

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Medical statisticians will be interested in an article in the *Public Health Reports,* August 18, 1922, on The Use of Semilogarithmic Paper in Plotting Death Rates, by George C. Whipple, professor of sanitary engineering, Harvard University, and Miss A. D. Hamblen, statistician of the Massachusetts Department of Health.

* * *

In response to appeals from many industrial plants requesting the United States Public Service to instruct them in available methods for preventing the dermatosis resulting from the use of cutting oils and compounds, a study of this subject has recently been made by William J. McConnell, passed assistant surgeon of the service, and its results published in *Public Health Reports,* July 21, 1922. A comprehensive bibliography is appended.

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Two interesting articles in the *World's Work* for September are Is the Gorilla Almost a Man? by Carl E. Ackley, recently returned from a sojourn in the gorilla region of Africa, and How I Filmed *Nanook of the North,* by Robert J. Flaherty. Both articles are attractively illustrated.

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The leading article in the first number of volume 2 of the Philippine Health Service's *Monthly Bulletin* is a comprehensive study by Dr. S. V. del Rosario, assistant director of health, and Dr. L. Lopez Rizal, consulting epidemiologist, on Some Epidemiological Features of Cholera in the Philippines.

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Marcel Provost: a New Sensibility is the title of an interesting psychological study of that French litterateur by J. Middleton Murry in the *Quarterly Review* for July. In the same number Ford Madox Hueffer discusses contemporary British novelists in A Haughty and Proud Generation.

* * *

Dr. Beverley Robinson, in a letter to the New York *Tribune* of August 20th, makes a most timely and forceful plea for the realization on the part of the visiting prison physician of his almost unlimited opportunities for bettering living conditions and care and treatment of prisoners by reporting unsanitary cells, poor food, lack of proper care for the sick, cruel or unnecessary punishment, and by advocating most earnestly the providing of the proper type of men for wardens. He can also accomplish a great deal for the good of both prisoners and the State by using his influence toward the proper education and training of delinquents with an end to making them selfsupporting.

* * *

The recent exaggerated romantic feeling toward the South Sea Islands and life thereon has a sane critic in Mrs. Willowdean Chatterton Handy, a student of primitive life and peoples, who went as a member of an official expedition, sent out by the leading museum of Honolulu, to study life in the Marquesas Islands. Mrs. Handy describes some of her experiences in an article in the *Yale Review* for July entitled The Marquesas; Fact Versus Fiction.

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New Publications Received.

DAS HAMORRHOIDALLEIDEN. Von. Prof. Dr. I. Boas in Berlin. Halle a. S.: Carl Marhold, 1922.

PSYCHIATRIE DU MEDECIN PRATICIEN. Par. M. Dide et P. Guiraud. Paris: Masson et Cie, 1922.

VERGLEICHENDE PSYCHOLOGIE. Von. Prof. Dr. Friedrich Dahl. Jena: Verlag von Gustav Fischer, 1922.

DIE METHODEN DER KUNSTLICHEN ERNAHRUNG. Von Dr. Max Einhorn. Halle a. S.: Carl Marhold, 1922.

DISEASES OF THE THYROID GLAND. By Arthur E. Hertzler, M.D. St. Louis: C. V. Mosby, 1922. Pp. 245.

AIDS TO BACTERIOLOGY. By William Partrige, F.I.C. New York: William Wood & Co., 1922.

A THEORY OF MONADS. By H. Wildon Carr, D.Litt. London and New York: Macmillan & Co., 1922. Pp. viii-351.

BIOLOGY OF SEX—FOR PARENTS AND TEACHERS. By T. W. Galloway, Ph.D. New York: D. C. Heath & Co., 1922. Pp. xiii-149.

LE MEDECIN DEVANT L'ASSISTANCE ET L'ENSEIGNEMENT PSYCHIATRIQUES. Par Henry Damaye. Paris: A. Maloine et Fils, 1922. Pp. 123.

DER CHRONISCHE HEREDITARE HAMOLYTISCHE IKTERUS. Von E. Meulengracht. Leipzig: Dr. Werner Klinkhardt Verlag, 1922. Pp. viii-226.

GESUNDHEITSSCHADIGUNGEN NACH HYPNOSE. Ergebnisse einer Sammelforschung. Von. I. H. Schultz. Halle a. S.: Carl Marhold, 1922.

LEITFADEN DER KINDERHEILKUNDE. Fur Studierende und Arzte. Von Dr. Walter Birk. Bonn: A. Marcus & E. Webers Verlag, 1922.

MANUAL OF PHYSIOTHERAPEUTICS. By Thomas Davey Luke, M.D., F.R.C.S. (Edin.). New York: William Wood and Company, 1922.

ROGUES' HAVEN. By Roy Bridges. New York: D. Appleton & Co., 1922. Pp. vi-285. Chocs Terapeutiques contre Chocs Morbides. Paris: Masson et Cie, 1922. Pp. 428.

EINIGE NEUERE BETRACHTUNGSWEISEN IN DER ERNAHRUNGSTHERAPIE. Von Prof. Dr. Alfred Gigon, Basel. Halle a. S.: Carl Marhold Verlagsbuchhandlung, 1922.

FRAMINGHAM MONOGRAPH (Medical Series No. IV). Donald B. Armstrong, M.D., Executive Officer, Community Health Station, Framingham, Mass., 1922, pp. 24.

TEN POSTGRADUATE LECTURES: Delivered before the Fellowship of Medicine at the House of the Royal Society of Medicine. 1919-1920. With a preface by The Right Hon. Sir Clifford Allbutt, P.C., K.C.B., M.D., F.R.S. New York: William Wood & Co., 1922. Pp. xvl-216.

Practical Therapeutics

CIRCULATORY STIMULATION IN LOBAR PNEUMONIA.

By Herman Fried, M. D.,
New York.

The dangers of routine methods in the treatment of lobar pneumonia become selfevident when we take into consideration the quick and kaleidoscopic changes that so frequently take place in the clinical picture and pathology of this disease. No other acute condition will tax and test the physician's finer powers of observation, as well as his discriminating judgment, as much as this will. And if this is true of those well qualified by long experience how much more should we be on our guard to lay down routine, iron clad, and inflexible rules when the direction for the treatment of this disease is often carried out by the younger, overzealous and less experienced physician.

There are about 140,000 deaths from pneumonia every year in the United States (1). As long as we have no specific for this dread disease, as long as serum therapy and chemotherapy offers so little, it is our duty to make an intense study of the three most important therapeutic indications in croupous pneumonia: 1, to prevent and conquer the toxemia; 2, to prevent and avert heart failure; 3, to overcome and successfully treat vasomotor paralysis. The study of circulatory stimulation will naturally only include the last two divisions of pneumonic therapy, namely, the treatment of cardiac embarrassment and vasomotor paralysis.

In spite of the warnings of Ortner (2), Hare (3), and Norris (4) the tendency of today is toward routine digitalization and stimulation of the patient. In the accompanying table the reader will find a synopsis of the recent literature on the subject under discussion. While it cannot be asserted that the table is a complete summary of the literature of the last five years on the subject, it can safely be said that no efforts have been spared to tabulate the most important methods of stimulation of the writers on this subject since 1916.

Looking at this table one cannot help noting that routine procedures predominate, that digitalis is the drug of choice, and that the chief armamentarium of stimulants is obviously directed against cardiac failure and not against vasomotor paralysis. Another feature one cannot help noting is the fact that alcohol which once held such prominent place in the treatment of pneumonia has now justly lost prestige and popularity. Moreover, everyone who has carefully studied the literature on this subject will miss the clearcut principles and definite indications for the rationale of stimulation in the course of this disease. For in the treatment of all conditions and particularly in pneumonia, it is the duty of the physician to correlate cause and effect. We cannot afford to sacrifice rational measure for set routine.

It should be remembered that death in croupous pneumonia is due most frequently and primarily to the action of poison on the vasomotor centres with progressive lowering of the blood pressure. Every clinician who uses the sphygmomanometer and observes the symptoms of a severe toxic pneumonia will testify to that fact in spite of Porter and Newburg's animal experimentation attempting to prove the contrary (5). Anatomical studies have repeatedly shown that the heart muscle is rarely diseased as the result of a pneumonococcus infection (6).

Indeed lethal termination in this disease never takes place like in an ordinary heart failure, unless the patient has been suffering from cardiac trouble. What really happens in most cases is, what Morris so aptly described: "The blood accumulates in the dilated splanchnic vessels and the vital contents and the other organs are insufficiently oxygenated. The blood is gradually drawn from the periphery and continues to be pumped with a steadily increasing pulse rate into the great stagnant pool. Intracardiac pressure falls, the cardiac and respiratory centres, as well as the circulatory arteries themselves, are progressively less well supplied with blood until at length complete collapse occurs."

We should also bear in mind that there are two classes of stimulants, which may be used in pneumonia, viz., the cardiacs and the vasoconstrictors.

The cardiacs or cardiants, as they are sometimes called, are drugs which act on the cardiac mechanism either by their effect on the sympathetic nervous system, or by toning the heart muscle, or by their action on the cardioinhibitory centres.

The vasoconstrictors are agents which exert a definite influence on the vascular system increasing the blood pressure by stimulating the vasoconstrictor nerves, or by toning and nourishing the walls of the bloodvessels. Digitalis, strophanthus, camphor and alcohol are representaive of the former, while strychnine, atropine, caffeine, epinephrine and pituitrin are examples of the latter class.

Digitalis is chiefly and primarily a stimulant of the muscle of the heart. It lengthens diastole, it increases the force of systolic contractions, it regulates arrhythmic action through the inhibitory nerves and energizes the muscular power of the walls of the heart. Yes, it does all that for the myocardium; but the action of this drug on the vasomotor apparatus is slight, insignificant and merely incidental. Digitalis is the great supporter of the heart not of the vasomotor mechanism. Is it not therefore amazing that in the treatment of pneumonia when the great sufferers, the vasomotor centres, are obviously failing and falling on the roadside, no one seems to come to their aid and rescue?

It is strange, yet very few clinicians seem to lay any great stress on the administration of atropine, the great vasomotor contractant, on the use of strychnine, the great stimulant to the vasomotor centres, on the administration of the extract of the posterior lobe of the hypophysis or on the use of adrenalin, the supporters of the vasomotor system.

It is true that dilatation of the right heart sometimes occurs, and at times even becomes a very important and serious feature to be dealt with. But this is only found where the pulmonary involvement is extensive and the right side of the heart is suffering by reason of obstruction of the pulmonary circulation, or where the heart has previously been taxed, as in old age by kidney lesions, arterial, myocardial or pulmonary diseases. Here the pathological condition differs entirely from a condition of a vasomotor paralysis. Here we have less blood in the pulmonary circulation. The pulmonary pressure falls and the rate of flow in the lungs is diminished. A systemic venous congestion occurs because less blood is taken from the general circulation; the blood flow in general becomes retarded (7).

Now is the time for that class of stimulants known as cardiacs like digitalis, to come to our aid by maintaining the heart's action. They can have no effect upon the disease itself, but can help us most opportunely to sustain the heart, which is now under great pressure, yielding to the strain of forcing the blood through the pulmonic capillaries whose lumen is now reduced by their edematous condition and by the presence of an exudate. Now the action and the wonderful aid that digitalis offers us is properly timed and indicated. But reason and good judgment utterly fail to justify the routine administration of digitalis which most probably is only rarely indicated in the treatment of croupous pneumonia.

Indeed if any drug or group of drugs might reasonably be selected for routine treatment in pneumonia, one would be inclined to favor the vasoconstrictors like atropine, strychnine, pituitary extract, adrenalin or caffeine, which have been mentioned above, and which seem to be the most frequently indicated in the course of this disease. No wonder that Sterling (21) advises early and routine use of atropine; "in order to contract the splanchnic area and dilate the peripheral vessels"; and no wonder that Cohen (16), after considerable experimentation with various pressor agents—atropine, cocaine, epinephrin and the posterior pituitary principle in particular, chose the last named for routine administration, "because it excels all others in that it possesses both of the most important requisites namely intensity of action as a vasoconstrictor and duration of effect."

Author	*Treatment directed against*	*Drugs mainly used*	*Other stimulants*
F. Lord (8)	Myocardial weakness and toxemia	Digitalis routine from 2nd day of disease; 10m. doses of the tincture. To be increased with full development of cardiac weakness	Camphor, strophanthine, caffeine, strychnine, adrenaline
P. H. Hartley and R. Powel (9)	Heart failure and hyperemia of sound lung.	Quinine and brandy; 20 gr. of quinine in 24 hrs. and in anticipation of heart failure 5 to 10 drops of tincture digitalis	Alcohol, quinine, strychnine with digitalis, caffeine, venesection in dilation of right heart
W. J. Stone, B. G. Phillips and W. P. Bliss (10)	Cardiac failure	Routine — Digitalization the earliest stages. Dosage estimated according to body weight	
C. C. Carrol (11)	Not definitely stated	Strychnine 1/30 to 1/15 gr. Every 3 or 4 hrs. routinely	**Digitalis,** morphine, caffeine, camphor
W. R. Burr (12)	Cardiac and vasomotor deficiency	Strychnine. Atropine. Hypodermoclysis of normal salt with adrenalin	Brandy
A. L. Burnett (13)	Evidently against cardiac failure though not definitely stated	Digitalis routinely until complete digitalization in the early stages	**Alcohol,** especially to drunkards; camphor
L. M. Warfield (14)	Toxemia and cardiac failure	Strychnine to 1/20; 1/15 gr. every 3 hrs, not routinely	Digitalis, morphine
M. F. Morris (15)	Heart failure due to myocardial weakness	Digitalis and morphine	Caffeine, aromatic spirits ammonia, camphor, strophanthine, atropine, nitroglycerine
S. S. Cohen (16)	Vasomotor paresis. (Follows Gibson's rule)	Pituitary principle and 1 c.c. every 3 hrs. Digitalis 5m. t. i. d. routinely	Cocaine, epinephrin, atropine
E. E. Cornwall (17)	Cardiac failure	Strychnine, 1/60 gr. every 4 hrs.; if more stimulation needed tincture strophanthus, 3 m. every 4 hrs.; if more stimulation needed caffeine 2 gr. every 4 hrs.	
Robert Abrahams (18)	Evidently cardiac failure	Digitalis is the paramount role in pneumonia of all kinds	Uses other stimulants
Leo Kirby (19)	Cardiac failure	Routine plan of stimulation in which digitalis plays most important role	Uses other stimulants
S. Neuhof (20)	Toxemia causing cardiac failure; seems to doubt vasomotor paralysis in pneumonia	Withholds no stimulants; is skeptical of the efficacy of all	
A. Sterling (21)	Vasomotor paralysis and edema of the lung	Early routine administration atropine	Also digitalis and other stimulants

But we should not jump from one extreme to the other. Any set plan of treatment in pneumonia is bad in principle. No other disease gives the physician a truer picture of the pathology and the changes that are constantly going on, as this disease does, and it is not necessary to adopt any regular set plan. Nothing can be more reprehensible than routine stimulation. Cardiac deficiency as well as vasomotor paresis can be treated promptly in its earliest manifestation. By careful watching of the patient, we can anticipate which end of the circulation will be embarrassed. The symptoms the patient presents from time to time serve as the guide and clearly indicate what stimulant or group of stimulants should be used.

In other words, given two cases of pneumonia, one will clinically manifest—a falling blood pressure, rapid pulse, pallor, sweating, cardiac arrhythmia, abdominal distention, progressive prostration and stupor; these are symptoms of vasomotor failure or deficiency and call for atropine, strychnine, epinephrine or pituitary extract; the other case will manifest cyanosis, venous distention, tachypnea, a weak pulmonic second sound, high pulse rate, muffling of the first sound, enlargement of cardiac dulness to the right, impaired urinary output, hepatic pulsation and pulmonary edema; these are symptoms of dilatation of the right heart and cardiac insufficiency and should be met with cardiac stimulants such as digitalis or its group. Keeping these two strikingly different aspects in mind, there can be no misunderstanding as to which class the patient belongs and hence no mistaking as to the proper kind of stimulants the patient requires.

Perhaps another indication for stimulation in lobar pneumonia which frequently arises during or previous to the crisis, and for which we should always be on the lookout, is the nonprogressive circulatory collapse. This is sometimes spoken of as the sudden collapse, and may be the result of either the toxic paralysis of the vasomotor centres, toxic degeneration of the myocardium and excessive pressure in the pulmonary circulation. This condition manifests itself by sudden rapid and weak pulse, sudden cyanosis and dyspnea, sudden fall of temperature, and sudden sweating and cold extremities. These symptoms plainly call for rapidly acting diffusible stimulants such as aromatic spirits of ammonia, Hoffman's anodyne, strychnine and camphor, external heat in the form of hot bottles, and atropine for excessive sweating. The postcritical sudden collapse coming a day or two after the crisis is another condition which calls for rapidly diffusible stimulants; but unhappily this condition almost always proves fatal and is most probably the result of an acute cardiac dilatation or of a pulmonary thrombosis.

Lastly, the condition known as acute pulmonary edema may occur during the course of lobar pneumonia at any stage. This most probably is the result of increased capillary tension in the lung tissue, plus the degeneration of the endothelium of the capillaries, brought about by toxemia. The treatment for this condition is hypodermic injections of atropine, with the aid of camphor, strychnine and ether, also venesection or dry cups.

In short, it should be remembered: 1. That there are definite and clear indications for different stimulants in lobar pneumonia. 2. The prevalent belief, that cardiac failure is the most frequent cause of death in this condition, is erroneous. 3. The circulatory embarrassment that actually occurs and which most frequently is the cause of death in croupous pneumonia, is vasomotor paralysis. 4. The drugs known as vasoconstrictors will most often be indicated in this disease. 5. Routine digitalization and the tendency to follow routine measures in the treatment of lobar pneumonia are reprehensible and should be discouraged. 6. That the symptoms of vasomotor paresis are a falling blood pressure, rapid pulse, pallor, sweating, cardiac arrhythmia, abdominal distention, progressive prostration and stupor and they indicate the use of atropine, strychnine, epinephrin. 7. That the symptoms of cardiac deficiency are cyanosis, venous distention, tachypnea, a weak pulmonic second sound, high pulse rate, muffling of the first sound, enlargement of cardiac dulness to the right impaired urinary output, hepatic pulsation, and pulmonary edema, and these symptoms clearly indicate the use of cardiac stimulants such as digitalis or its group.

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20 WEST 120TH STREET.

Splenectomy in Banti's Disease.—David Fisher (*Surgery, Gynecology, and Obstetrics,* August, 1922) summarizes as follows: Splenectomy has come to be a common surgical procedure, and is now indicated in any condition characterized by splenomegaly, with or without enlargement of the liver and ascites. Splenectomy in Banti's disease affords the only means of relief or cure. Judgment as to its ultimate value in this condition should be cautious until a sufficient number of cases are on record with adequate followup reports, and with this in view a plea is made for detailed reports of all cases so diagnosed. A summary of the literature of the past twenty years shows thirty cases reported, in which the etiology was unknown. Two cases of Banti's disease in the terminal stage are reported, one case giving a positive Wassermann which was due to jaundice, and which resulted in an apparent cure after splenectomy, the patient being free from all symptoms six months and one week after operation. One patient died twelve hours after operation.

Abstracts from Current Literature

OBSTETRICS

Cæsarean Section: With Special Reference to Present Day Indications for Operation.—Charles J. G. Taylor (*British Medical Journal,* June 10, 1922) cites the following as absolute indications for Cæsarean section: 1, extreme forms of pelvic deformity, as with a conjugate diameter of two to two and a quarter inches or less, and 2, hard solid tumors fixed in the pelvis and causing obstruction severe enough to interfere with the delivery. The relative indications are: 1, a contracted pelvis with a true conjugate of three and a half to three and three quarter inches or less, provided the vaginal examinations have not been too frequent and the child is still alive; 2, tumors; 3, placenta prævia; 4, eclampsia and chronic nephritis aggravated by pregnancy; 5, concealed accidental hemorrhage when other methods fail; 6, after ventrofixation; 7, in prolapse of the cord, and 8, in impacted shoulder presentations it is hardly to be recommended; 9, abnormal conditions of the child, such as excessive size, especially with a breech presentation and rarely for brow, impacted breech and occiptoposterior positions; 10, retraction and contraction rings; 11, scar tissue and rigid cervix or an unreduced occipitoposterior presentation, extensive edema of the vulva and very severe varix of the vagina and vulva, and 12, serious disease of the mother, as fully developed mitral stenosis or advanced pulmonary tuberculosis. Postmortem Cæsarean section may deliver a living child twenty to twenty-five minutes after the death of the mother. Today it is not considered justifiable to sterilize a woman at the time of the Cæsarean section, except when it is necessary to obtain a successful result, as in hysterectomy for fibroids. Women have been subjected to repeated Cæsarean sections without harm. Those cases in which the uterine scar is too weak to withstand a subsequent pregnancy, resulting in uterine rupture, are due to sepsis at the time of the original operation.

Cæsarean Section.—Samuel J. Cameron (*British Medical Journal,* June 10, 1922) prefers to use chloroform anesthesia in rachitic patients as they are extremely susceptible to pulmonary disorders. Cæsarean section is indicated: 1, in all cases of contracted pelvis, provided the patient is not infected; 2, neoplasms of the uterus, ovaries or pelvic bones; 3, excessive cicatricial contraction of the cervix and vagina; 4, in certain cases of accidental hemorrhage and placenta prævia in elderly patients and a live child; 5, the author is opposed to it in eclampsia; 6, ventrofixation and vaginal fixation of the uterus; 7, in the presence of a retraction ring in front of the presenting part. The best time for operating is during the first stage of labor, although the author has operated before the beginning of labor. An incision through the rectus sheath is recommended so as to avoid a weak scar and it should always be on the right side. Separate knives are used for incising the abdominal and uterine walls, respectively, so as to avoid infection. In order to avoid the formation of numerous and dense adhesions from repeated Cæsarean sections, the uterus should be evacuated through transverse incisions in the abdominal and uterine walls, about the level of the umbilicus and near the fundus of the uterus. The treatment of the uterus includes the extraction of the fetus as a breech presentation by the foot; after the delivery of the child the uterus is drawn out through the wound and turned inside out for detachment of the placenta and membranes with gauze. The inner wall is then thrust back into position and the uterine wound closed with through and through sutures of silk, followed by a catgut suture, and the abdominal wound closed in tiers. If vaginal bleeding occurs, the uterus should be compressed through the abdominal wall. The Fowler position is advocated during convalescence.

Cæsarean Section on the Painless Uterus.—Oskar Prinzing (*Zentralblatt für Gynäkologie,* June 4, 1922) recommends the performance of Cæsarean section even on uteri not undergoing labor pains, in view of the excellent results obtained in certain cases of previous enucleation of myomata, previous Cæsarean section, placenta prævia and in extreme grades of pelvic contractions. The most dreaded complications of this procedure—severe atony and the retention of lochia—were never encountered and can be prevented by intravenous injections of hypopsysin, which diminishes the dangers and has great advantages over Cæsarean section in the way it is usually done after the labor pains have set in. Packing is necessary only in exceptional cases. The results are particularly favorable because of the extraordinarily aseptic operative conditions, and the avoidance of examinations outside of the hospital. These advantages, however, must not serve as an excuse for the relaxation of the strict observance of the indications. On the contrary, the indications for this procedure on the painless uterus must be observed with particular strictness and it should be done only when there cannot be any doubt that without the operation the mother would be injured most severely, or that the viability of the child is an impossibility.

Repeated Cæsarean Section. — Thomas O. Gamble (*Bulletin of the Johns Hopkins Hospital,* March, 1922) used as a basis for this paper a study of sixty-three pregnancies occurring in fifty-one women, who had previously been subjected to Cæsarean section. Fifty-five of these pregnancies followed a single Cæsarean section, while in eight there were two operations. The manner in which the pregnancies terminated was as follows: A second or third Cæsarean section was done in forty-five cases; vaginal delivery occurred in seventeen cases, and rupture of the old Cæsarean scar occurred in one case. The causative factors in the production of the thin, imperfect scar, and the conditions predisposing to its rupture are discussed in detail under the following headings: Infection, improper suture technic; unsuitable suture material; location of the uterine incision; involvement of the placental site at operation; implantation of the placenta over the scar, with inversion of fetal elements; miscellaneous conditions. As a result of this study the author concludes that the weak Cæsarean scar may be due to a single factor or to a combination of factors, the most important of which is infection. An afebrile puerperium does not give an absolute assurance of perfect wound healing. The perfection of technic in suturing the uterine incision will undoubtedly lessen the incidence of weak scars. Chromic catgut, in the author's hands, has been a satisfactory suture material. The uterine wound should not be closed, if possible, until firm contraction of the musculature has occurred. As a rule fetal elements do not invade the uterine scar. Adhesions following Cæsarean section are common, not necessarily being the result of coexisting infection, and they may give rise to serious complications at subsequent operations. The dictum "once a Cæsarean, always a Cæsarean" cannot be accepted without considerable reservation. A patient who has once been subjected to a Cæsarean section should enter the hospital several weeks prior to the expected date of confinement, so that she may have the benefit of immediate operation should rupture occur.

The Effect of Food on the Development of Eclampsia and Albuminuria.—J. Ma. Ruiz-Contreras (*Zentralblatt für Gynäkologie,* May 13, 1922) states that, although a large number of cases of eclampsia and albuminuria in pregnancy are yearly seen in private practice, albuminuria only occurs in 0.2 per cent. of the cases visiting a certain clinic, where the patients are of the poorest class, and eclampsia was not seen at all in a series of four hundred labors. The author believes that this lesser incidence of these conditions in the poorer class of people is due to a difference in diet—a markedly reduced ingestion of meat and eggs. When the diet was enriched with meat and eggs, as a result of improved social conditions, there was a marked increase in the incidence of eclampsia and albuminuria: three cases of eclampsia were seen as a result and albuminuria was found in six per cent. among one thousand pregnancies. As there was no other change in the diet, the author concludes that as little as possible of nitrogenous food is the best prophylactic against the eclampsia and albuminuria of pregnancy.

Posthypnotic Birth Analgesia.—Heinrich Kogerer (*Zentralblatt für Gynäkologie,* June 4, 1922) states that the posthypnotic analgesia is the best procedure for achieving painless births in use today. The chemical procedure is dangerous to the child, which is not the case with hypnosis. It should be the aim of every physician to avoid unnecessary pain, without interfering with the psychical experience of birth. The analgesia is tested with the prick of a needle on the back of the hand. In easy cases, verbal suggestion is sufficient, but in the more difficult cases the abdomen should be stroked. About ten to fourteen sittings suffice for the attainment of a lasting posthypnotic analgesia. It is a great advantage to prepare several women at the same time, as it results in a certain amount of rivalry, which helps to gain the point desired. It is also advantageous to increase the state of hypnosis during labor pains. Of twenty-seven cases treated in this way by the author, nineteen were successful. Five cases were failures because of hysteria; hysterical patients are unsuited for this procedure because of their slight power of concentration and the weakness of their will power. In some cases there resulted only a reduction of the sensibility to pain. One patient could not be hypnotized because of the persistence of her affection (epileptic) and she was in a state of constant angry excitement. Pregnant women are easily hypnotized, probably because of the concentration being directed to the birth, or possibly because of toxic influences upon the (hypothetical) centre of sleep. In rare cases only do women refuse analgesia, which may be attributed to both an exhilarated or depressed state of mind. The author recommends the use of this procedure in clinics.

Fifty Births Under Hypnosis.—Heinrich Heberer (*Zentralblatt für Gynäkologie,* May 13, 1922) reports that hypnosis can be successfully used in labor to produce painlessness, provided it is possible to reproduce the same hypnotic stage during labor as was achieved during the pregnancy. This is accomplished by strengthening the suggestion when the pregnant woman is in the deepest stage of somnambulism, so that when she hears the cue from the mouth of the hypnotizer she returns to the correspondingly deep state of sleep to which she had been brought previously. The woman is then awakened, the cue is repeated in some other connection and immediately the desired state of hypnosis returns. She remains in this hypnotic state during the whole course of labor, except that there rarely is a slightly drawn expression of the face during an exceptionally severe labor pain. The patient is finally awakened when the shoulders of the child are born and she therefore enjoys the pleasure and good fortune of a successfully overcome birth. The amnesia up to the time of awakening is complete. A deep hypnotic stage allows the performance of operative obstetric procedures: forceps were applied twice, perineal sections and sutures were done five times and one version. The women were all eminently satisfied with the results.

Posthypnotic Painless Labor.—H. Kogerer (*Wiener klinische Wochenschrift,* June 8, 15 and 22, 1922) asserts that posthypnotic analgesia is, at the present time, the best procedure for securing painless delivery and is successful in about seventy per cent. of the cases. At the present time no conclusions can be drawn regarding the limits of the possibilities of this method, especially in regard to its applicability in surgical cases. It is very likely that in certain cases, in which an operative delivery is necessary, that the preparation for hypnosis will serve as the starting point for hypnoanesthesia. In its present stage of development, this procedure should be applied in all those cases in which a painless delivery is desired or seems desirable and in which no excessive pains, severe enough to disturb the normal processes of labor, are expected. The author suggests that physicians who are in charge of the hypnotic preparation of the patient should be resident in the obstetrical hospital so that they may be at hand whenever needed; it is also very quieting to the patient. Physicians doing this sort of practice should be psychiatrists, as indiscriminate hypnotism is sure to be disastrous to patients, especially hysterical patients.

The author reports on a series of twenty-seven cases, in which the labor pains were eliminated or considerably diminished in nineteen and eight cases showed failures, due to the shortness of the preparatory period or psychopathic factors. The simplicity and soberness of the hypnosis, to which pregnant women are particularly susceptible, completely maintains the patient's consciousness and preserves the "birth experience"; it is not only absolutely harmless but even has ethical advantages. The posthypnotic analgesia is the best procedure for securing a painless birth. The duration of the effect of the hypnotic preparation on delivery was found to vary: usually three to four seances were sufficient and if no result was achieved within fourteen days, a subsequent success seemed unlikely.

DERMATOLOGY

Intravenous Silicic Acid Therapy in Pruritus Senilis. — Friedrich Luithlen (*Wiener klinische Wochenschrift,* April 27, 1922) found that intravenous injections of 0.5 to 2 c. c. of a one per cent. solution of the purest sodium silicate every second or third day produced no ill effects provided that not a drop of the solution was allowed to escape into the tissues. The results in a few cases of senile pruritus were excellent, the itching disappearing or improving almost immediately after the first injection. The maximum number of injections in any case was six. These results speak for the fact that the itching of senility, at least in many cases, is due to a diminution of the silicic acid content of the skin, associated with a disturbance of the mineral metabolism.

Spread, Probable Mode of Infection, and Prophylaxis of Leprosy.—After reviewing the history of leprosy and collecting seven hundred cases, Leonard Rogers (*British Medical Journal,* June 24, 1922) comes to the conclusion that leprosy has slowly spread all over the world as a result of direct or indirect communication from one patient to another through the causative bacillus. The exact mode of infection is still obscure owing to a lack of reliable methods of cultivating the organism and of infecting animals with it. The author's analysis shows that the probable source of infection in leprosy is sexual intercourse in 18.28 per cent.; occupancy of the same house, room, or bed in 39.84 per cent.; attendance on lepers in 19.87 per cent.; by close association in 19.42 per cent., and through a wet nurse, wearing lepers' clothes, vaccination and inoculation from a leper in 2.59 per cent. The first essential in prophylaxis is the removal of all infected patients from contact with the healthy, especially children and adolescents up to twenty to thirty years of age, who are the most susceptible. The most infective type of leprosy is the tubercular form, including the mixed cases with a discharge of large numbers of bacilli from the nose and breaking down nodules. The anesthetic cases, especially the chronic mutilated ones, have lost all infectivity. With the present use of the soluble preparations of the active unsaturated fatty acids of chaulmoogra oil, codliver oil, soja bean and other oils, a reliable method of clearing up the bacillus bearing lesions of leprosy, with the loss of infection, including cessation of the discharge of the organisms from the nose is available and treatment should be pushed more energetically.

Treatment of Erysipelas with Quartz Lamp.—Alois Czepa (*Wiener klinische Wochenschrift,* June 22, 1922) reports a series of one hundred cases of erysipelas, mostly of the face, in which the temperature fell and the progress of the inflammation was stopped in most of the cases after the first irradiation treatment with the quartz lamp. The technic is the most simple imaginable, consisting of merely exposing the affected area and its immediate surroundings to the rays of the lamp. Small doses of rays are ineffective and useless. The author used a distance of eighty cm. from the lamp to the patient and the time of irradiation was at least ten minutes with a burner that was not too old, and fifteen minutes or more with a burner that was old and showed a deposit. On the second and third days the irradiations were continued with a similar dose or one slightly increased. Cold applications with a 0.1 per cent. solution of resorcin or a very dilute solution of aluminum acetate are adjuvants. The inflammation heals within a few days; the reddening lasts somewhat longer than the temperature, owing to the erythema produced by the irradiation. The author prefers the ultraviolet rays of the quartz lamp to those of the röntgen rays and recommends them for more extended use.

Röntgen Irradiation of the Thymus in Psoriasis.—P. Schneider (*Wiener klinische Wochenschrift,* June 22, 1922) reports his results with röntgen irradiation of the thymus in cases of psoriasis according to the Brock technic in twelve slight and severe cases. The age of the patients varied between seven and sixty-three years. The cases were observed at intervals of one and two weeks for five months. There was no uniform morphological or physiological local reaction or prompt healing observable. Several patients complained of increased itching shortly after the irradiation. Six cases were absolutely refractory to this treatment. Four cases showed no evidence involution in the psoriatic foci after six weeks and only two cases showed healing of the efflorescences during the course of six weeks. In both of these cases there seemed to be a close relationship between the irradiation and healing. In the four cases mentioned above such a connection was questionable and a spontaneous normal course of the disease was probably observed. The author palms and soles. Larval forms of the parasite and function of the thymus gland cannot be assumed because of the success achieved in two cases.

Case of Rhinoscleroma.—V. Pardo-Castello and Manuel M. Dominguez (*Cronica Medico-Quirurgica of Havana,* March, 1922) report the first case of rhinoscleroma seen in Cuba. They define the condition as a rare form of infectious granuloma which affects the nose and less often the upper lip and retropharyngeal region. The disease, according to Morrow's statistics covering fifteen years, shows an incidence of 0.0034 per cent. among skin diseases. It was first described in Hebra and Kaposi in 1870-72 and it is common in Austria and Russia. Castex has well said that "the home of rhinoscleroma is found on the banks of the Danube." The authors' case was in a woman of sixty-nine years, and pure cultures were obtained by a bacillus of the lactis aerogenes type.

A Cutaneous Nematode Infection in Monkeys.—Homer F. Swift, Ralph H. Boots, and C. Philip Miller (*Journal of Experimental Medicine,* May, 1922) describe a nematode to which they give the provisional name of Trichosoma cutaneum, 1922, which they found to infect monkeys and cause skin lesions, subcutaneous nodules, edema about the joints, and elongated serpiginous blisters of the palms and soles. Larval forms of the parasite and possibly adult male forms were found in the subcutaneous nodules. The worm lays its eggs in the epidermis, and the authors believe this to be the only description of a nematode who does so. The nematode is described, together with the histopathology of the palmar and plantar lesions, and the clinical picture of the infected monkeys.

Skin Cancer.—J. L. Kendall (*International Journal of Surgery,* February, 1922) asserts that in his opinion the factors favoring a development of skin cancer are a broken continuity of skin or mucous membrane; an irritation of some kind repeatedly applied to such skin or mucosa; a predisposition to such malignancy in precancerous dermatosis; and that the irritation is probably of a biological nature hitherto undetermined.

Epidermoid Cysts.—H. H. Sherk (*Surgery, Gynecology, and Obstetrics,* November, 1921) states that epidermoids are evidently of fairly frequent occurrence, but almost invariably unrecognized. They are almost always mistaken for sebaceous cysts. They may be either traumatic or embryonic in origin. The pearly, horny, and laminated contents make their recognition easy.

GASTROENTEROLOGY

Acute Inflammation of a Large Diverticulum of the Jejunum with Perforation.—Graham W. Christie (*British Medical Journal,* June 24, 1922) reports a case in a woman, forty-eight years old, who on the previous day was suddenly seized with an acute abdominal pain in the left side of the abdomen and below the umbilicus and repeated vomiting. The painful site was distinctly tender and slightly rigid. There was a hard, rounded mass, larger than a tennis ball, midway between the umbilicus and the symphysis pubis to the left of the midline. Operation fourteen days after the acute onset revealed a quantity of serous peritoneal fluid and the mass described above which was covered by a thick layer of omentum. On removing the omentum, a large spherical swelling, tense and fluctuating, was found springing from the antimesenteric border of a loop of small intestine, with a large gangrenous patch at its fundus with a perforation in the centre, through which very foul smelling pus and semisolid contents escaped. The condition was analogous to an acute inflammation of a Meckel's diverticulum which had perforated but had been taken care of by the omentum. The mass was extirpated and the lumen of the gut at the site of the attachment of the diverticulum was constricted. A lateral anastomosis was done between the short loop of jejenum above the site of the diverticulum and a loop below. The origin of the diverticulum from the jejunum was located nine inches below the duodenojejunal junction.

Recognition of Critical Acute Diseases of the Stomach and Intestine.—Julius Schnitzler (*Wiener klinische Wochenschrift,* June 22 and 29, 1922) emphasizes the necessity of quick action by the physician in cases of socalled acute abdomen, and particularly the determination whether surgical interference is necessary. He calls attention to critical abdominal cases, in which the making of a diagnosis is not at first the most important thing to decide, but rather the prognosis of the subsequent course of the case. The attending physician must decide whether prompt and active treatment is indicated to avoid a fatality, and whether an unfavorable ending will be more difficult to avoid or become inevitable if active interference is delayed. In some cases the course of action is readily decided upon; with complete intestinal obstruction, delay of even a few hours may be fatal. If there is marked meteorism, or if the intestines are markedly distended, or a single palpable look is much distended, or if fecal vomiting occurs, the critical danger line is reached. An advance beyond this line is evidenced by the loss of proper function of the sensorium, a thready pulse and by cold extremities. The most important thing is for the physician to recognize a critical condition when confronted by it and the necessity for help within a few hours and sometimes a few minutes. There is no single sign or series of symptoms that will absolutely determine the moment when interference is necessary. A relatively low temperature and a relatively high pulse rate is an unfavorable sign, but this condition may be absent in the most serious of conditions and therefore this sign cannot be depended upon as a criterion for the time of operating. If intestinal obstruction is suspected, the operation should not be delayed until fecal vomiting occurs. A sudden pallor may be due to either a sudden hemorrhage or to the amount of blood lost.

Acute Primary Phlegmonous Enteritis.—J. B. Ferguson Wilson (*Lancet,* June 24, 1922) reports a case in a woman, thirty-eight years old, who was admitted to the hospital complaining of severe abdominal pain which had recurred repeatedly for several years. The last attack began three days before with pains all over the body, a chill, vomiting for several hours, at first black in color. After a dose of castor oil the stools were also black. The pain became very violent and the patient appeared severely ill with a rapid pulse and slight fever, cyanosis, general rigidity and tenderness of the abdomen, especially on the left side. A diagnosis of acute hemorrhagic pancreatitis or perforated gastric ulcer was made. At operation a dilated coil of jejunum was found which was enormously enlarged, forming a rigid tube with thickened and brawny walls. The serosa was injected and reddened and at its point of contact with the posterior wall there was a patch of fibrin. The mesentery was thickened and showed some small hemorrhages. The circulation of the mesentery and intestines was unaffected, but above and below this region there was a fairly sharp line of demarcation. As resection of the gut was impossible because of the patient's poor general condition, a lateral anastomosis was done between the jejunum above and below the affected region. Several days later an empyema developed for which a rib resection was done and which yielded a pure culture of pneumococcus. Acute primary phlegmonous enteritis is a very rare condition. It occurs mostly in the upper part of the small intestine, especially in the duodenum. The pneumococcus is usually responsible for this lesion whereas in phlegmonous gastritis the streptococcus is usually found.

A Modification of the Operation of Cholecystenterostomy.—Andrew Fullerton (*British Medical Journal,* June 24, 1922) advocates the following procedure for the relief of obstruction in chronic pancreatitis, where the flow of bile from the common duct to the duodenum is partially or completely obstructed: The gallbladder is opened and cleared of its contents and most of the viscus is removed after clamping it near its neck. The small remaining portion is anastomosed to the duodenum so that at the end of the operation the cystic duct opens into the duodenum without the intervention of any sac which might harbor gallstones or regurgitated intestinal contents. Just enough gallbladder is left to allow the anastomosis to be done satisfactorily.

Biliary Infections.—John W. Sluss (*Journal of the Indiana State Medical Association,* April 15, 1922) makes the following points: The importance of hepatic function is being overlooked both in diagnosis and therapeusis. The question of gallstones and their surgical treatment has overshadowed allied problems to a serious extent. Gallstones are to be regarded merely as byproducts and not the inevitable concomitants of infective inflammation of the biliary passages. Our attention should be directed to the bacterial agencies of cholangitis, their foci and mode of attack. The most common infective agents are the colon bacilli and the streptococcus, each of which is capable of producing a syndrome. The colon bacilli are more related to catarrhal processes with adventitious cholelithiasis, while the streptococci give rise to the serious acute inflammations and in chronic forms the slowly destructive and sclerotic changes. The sole principle of surgical treatment of cholangitis is drainage, which includes removal of mechanical obstruction. Removal of the gallbladder should not be made a routine part of such drainage. Surgery of the biliary tracts calls for the highest degree of surgical judgment independent of technical skill.

The Duodenal Tube in the Diagnosis and Treatment of Biliary Diseases.—Jonathan Meakins (*British Medical Journal,* June 24, 1922) states that the duodenal tube is most useful both for the diagnosis and treatment of diseases of the biliary tract. If there is biliary stasis independently of complete obstruction, the tube may be used to promote free and periodical drainage of the gallbladder and bile passages, especially when the stasis is associated with chronic inflammatory disease. If operation is inadvisable in the presence of gallstones, marked amelioration of the condition is impossible. Duodenal tube drainage has the advantage of producing no physiological disturbance of organization as occurs following operation. After cholecystectomy the rhythmic flow of bile ceases and the bile constantly dribbles into the duodenum, whether necessary or not, and may therefore exert a harmful influence. In addition, the concentration of the bile which takes place normally in the gallbladder, cannot occur after cholecystectomy. In cholecystenterostomy, not only is the gallbladder physiologically eliminated, but a permanent avenue of infection is opened from the bowel into all the radicles of the biliary system.

Catarrhal jaundice is usually associated with stasis and infection of the bile and therefore drainage is indicated; with the duodenal tube, catarrhal jaundice may be considerably reduced in duration. In cholecystitis and cholangitis of not too severe a degree, complete evacuation of the gallbladder at intervals of twenty-four hours is especially indicated and promotes freer drainage and a more rapid resolution of the disease; it also helps to remove small collections of pus, cholesterin, coagulated bile salts, mucus and bacteria, which are likely to form nuclei for calculi; the chances of the infection spreading are also diminished. The tube also hastens duodenal drainage in cases where surgical drainage of the gallbladder has been instituted. Whereas small faceted gallstones are rarely, if ever, evacuated by the use of the duodenal tube, biliary sand is not uncommonly found in the bile. In cases of cholelithiasis in which operation is contraindicated, relief may be obtained by the use of the duodenal tube; at any rate, it clears up the infection and thus obviates recurrent attacks of cholecystitis.

Gallbladder Disease.—Frank D. Moore (*Surgery, Gynecology, and Obstetrics,* September, 1922) summarizes as follows: 1. The existence of gallbladder infection is more frequent than is commonly supposed. 2. The amount of pathology due to or associated with disease of the gallbladder is very extensive and is frequently overlooked. 3. The associated pathology of cholecystitis includes practically every abdominal organ and many structures in distant parts of the body. 4. The rôle of the gallbladder as a focus of infection is being more and more realized. 5. Not only should the gallbladder be examined in every pathological condition of the abdomen, whenever possible, but in every systemic condition of unkown origin or uncertain diagnosis. 6. In every case of diseased gallbladder the surgeon should not be content with removal or other treatment of the primary condition, but should look for possible secondary pathology, that this, too, may be cared for.

Differential Diagnosis Between Cholelithiasis and Duodenal Ulcer.—W. J. McKeand (*Lancet,* June 3, 1922) reports a case with the following curious features: Pain of the type seen in duodenal ulcer, occult blood in the stools, an apparently beneficial result from rest and diet, absence of Murphy's sign, absence of jaundice throughout the disease, no obvious enlargement of the gallbladder on palpation and percussion, and no definite signs of gallstone colic; all of which led to the diagnosis of duodenal ulcer. The röntgenogram showed colonic ptosis and adhesions between the ascending and transverse colons. A test meal may have suggested a different diagnosis, but was refused. At operation, a distended gallbladder was found full of stones, with slight congestion of the duodenum in its immediate vicinity. Cholecystectomy was followed by uneventful recovery.

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NEW YORK, WEDNESDAY, OCTOBER 18, 1922

MISCELLANEOUS

Nitrous Acid Poisoning.—W. St. Clair McClure and Harri Heap (*Lancet*, June 10, 1922) report the accidental poisoning of six persons by nitrous acid caused by the admixture of sodium nitrite with their food. The symptoms were about the same in all but varied in degree. The first sign of illness appeared between fifteen and thirty minutes after eating; there were dizziness and a swimmy feeling with great flushing and throbbing of the head, a choking sensation, slight pain in the stomach and nausea, but no vomiting; unconsciousness supervened within half an hour; all of the cases showed a grayish blue color of the lips; there was no pain and no diarrhea. All recovered. The severity of the illness varied according to the body weight of the patient and the size of the dose.

Pathology and Treatment of Chronic Catarrhal Deafness.—Perry G. Goldsmith (*Canadian Medical Association Journal*, May, 1922) reviews what is known at present concerning the treatment of this unfortunate condition, but does not draw a hopeful picture. Still, he says, if we are not able to influence the course of the disease by aural medication, we may lessen some of its distressing features, and of these tinnitus is by far the most urgent. Its early appearance is of bad omen, and sometimes is so bad that relief from it is more sought by the patient than an improvement in hearing. He has obtained benefit in tinnitus through the use of dilute hydrobromic acid in doses of twenty-five minims with very small doses of quinine, one quarter to one half grain. A smart mastoid blister, a pilocarpine sweat, or a Turkish bath is very useful, and small doses of thyroid have been spoken of favorably. Unfortunately there remain many cases in which medicines are of no value, but the patients are less affected if assured that no brain disease is present, and that in time the noises will become less. The use of electrical devices to produce a continuous note corresponding to that heard by the patient has had some vogue in France, but English aurists who have used it do not speak enthusiastically about the method. Lastly there remains operative treatment of the eighth nerve, but even this may not suffice though audition has been destroyed.

Absorption of Calcium Salts in Man.—Edward H. Mason (*Journal of Biological Chemistry*, June, 1921) reports that a single large dose of calcium lactate dissolved in water, or in hydrochloric acid and given with water, or with codliver oil, has little influence on the plasma values. Calcium chloride seems to be absorbed better and shows more consistent increases in the plasma values.

Experiences with Bazillosan.—Fritz Hanak (*Zentralblatt für Gynäkologie*, June 10, 1922) asserts that thirty-seven cases treated exclusively with bazillosan showed unsatisfactory results: in not a single case was a lasting normal vaginal secretion obtainable even though the instructions as to its use were carefully followed. No explanation can be offered for these poor results, except possibly the latency of the bacteria. The lactic acid bacilli were demonstrable in pure cultures of bazillosan for four generations without producing any change in the bacterial flora of the smears. The author believes that bazillosan in its present form is ineffective.

Postural Subsartorial Bursitis.—R. Davies-Colley (*Lancet*, June 3, 1922) describes a form of postural bursitis never before described. A chronic inflammation and enlargement of the subsartorial bursa occurring in the author himself led to the discovery that the night's rest caused the lesion, with pain and swelling of the bursa most marked on stretching the legs in the morning. The bursitis is caused by lying on the side with one knee resting on the other, the inner tuberosities of the two tibiæ with their overlying tendons of the sartorius muscles and the bursæ being pressed against each other. With relief of the pressure on the tuberosities by any means whatever, the inflammation of the bursæ subsides permanently.

Observations on the Amebicidal Action of Conessine.—H. C. Brown (*British Medical Journal*, June 24, 1922) reports upon the use of conessine (Merck), an alkaloid having the formula $C_{12}H_{20}N$, which has been derived from several members of the family of Apocynaceæ and exerts a very strong inhibitory action upon the growth of free living amebæ. Its action is equivalent to that of emetine. The amebicidal action of these alkaloids is considerably reduced on contact with intestinal mucus and after four hours' contact it is entirely destroyed, but it was shown that conessine is not affected by contact with intestinal mucus to quite the same extent as is emetine. Although it produces necrosis at the site of a subcutaneous injection, it may be given orally or intravenously in suitable cases without producing any unpleasant symptoms. Conessine was used in the form of a sulphate and animal experiments showed that the subcutaneous minimum lethal dose for a mouse is about 3 mg. and of emetine it is 2 mg. The intravenous minimum lethal dose of conessine and emetine are 0.45 mg. and 0.3 mg. respectively, showing that emetine is approximately fifty per cent. more toxic than conessine.

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Some Recent Advances in Urological Surgery*

By HENRY G. BUGBEE, M.D., F.A.C.S.,
New York.

The advances in the field of urology have been so rapid and revolutionary during the past twenty years, and especially during the past ten, that a brief capitulation of the progress attained in solving some of the most important urological problems may be of interest, especially to those engaged in other branches of medicine and surgery. The foundation of any clinical study must be a knowledge of pathology and diagnosis. Our present standards of these branches of urology are definite and solid, due to accurate methods of study of the urinary tract.

Methods of dealing with the pathological conditions presented in urological lesions have progressed, the present keynote to success (meaning an elimination of the lesion) being early recognition.

Specialization has become so widespread that there is often, on the part of the general practitioner, a hesitation to seek the advice of the specialist. This hesitation is often well founded. He feels that he may lose supervision over the patient and that in going to a busy specialist, the patient will receive a hurried examination, sometimes biased by the specialist's particular hobbies and will possibly be hurried into radical treatment. There is some ground for such an attitude on the part of the general practitioner. The rapid rush to specialism has produced many socalled specialists, lacking a foundation which can be obtained only through the practice of general medicine and surgery. The limitations of such men are sooner or later recognized and they become technicians.

A field of study such as urology requires decided breadth of vision. Continued study in this domain serves to link the urinary tract more closely to the entire body and its various functions, rather than draw it away into a more isolated specialty. For this reason, a very definite understanding and coordination is necessary between practitioner and urologist, that the patient may benefit by the well rounded, accurate interpretation of urological symptoms. The past observations of the patient by the physician should be of decided advantage to the urologist in making out the particular urological problems, while the physician should obtain knowledge which will help him in carrying out details of treatment leading to the relief of symptoms or preparation of the patient for radical procedure.

Urological problems are often intricate, require time and continued observation for their solution and the patient and physician are entitled to both from the specialist. How true this is of infections of the urinary tract! The factors involved in urinary infections are the supply of bacteria to the urinary tract and interference with urinary drainage. The first factor, i.e., the supply of bacteria to the urinary tract is a general medical problem, requiring for its solution the discovery of focal infections, or disturbances of body functions. For the proper solution of the individual case, the services of the röntgenologist and the specialist in some other branch of medicine or surgery may be necessary, but the internist should supervise the study. The particular urological condition interfering with drainage must be solved by the urologist. Whether this is due to displacement of kidney or bladder, congenital anomaly, pressure upon or constriction of ureter, obstruction of vesical outlet or urethra, must be ascertained, but the first factor, i.e., that of supply of bacteria, is just as important.

The first evidence of a urinary infection may be the presence of blood, or pus, or both, in the urine, or when interference with urinary drainage is complete, as with an occluded ureter, constitutional symptoms are present, due to absorption, while the voided urine may be clear. With incomplete urinary drainage and infection of the urinary tract, symptoms such as frequency, urgency and burning urination are present, while with complete interference with drainage of a urinary focus, urinary symptoms are absent, but there is local pain from back pressure, as pain in the loin with an occluded ureter.

The presence of pus cells in the voided urine in the male or catheterized specimen in the female is im-

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*Presented before the Connecticut State Medical Society, at its one hundred and thirtieth annual meeting, Bridgeport, Conn., May 18, 1922.

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portant and the urethra, bladder, ureters and kidneys must be studied by a thorough cystoscopic examination and röntgenogram; also the genital tract in the male.

What are some of the lesions detected by such early examinations? Stricture, congestion of the deep urethra and verumontanum, seminal vesiculitis and prostatitis; obstruction of the vesical neck; stone, tumor and diverticulum of the bladder; stricture, kink, stone in and pressure upon the ureter; prolapse, congenital anomaly, stone, tumor and cystic kidney; for the relief of each, early diagnosis is important.

Another urinary finding of the greatest importance is the presence of blood in the urine. To allow a patient with blood in the urine to pass by without a complete urological examination is a serious offense. While an isolated case of congestion without pathological lesion may cause hematuria, this sypmtom usually denotes a serious condition and is so often, even in the absence of any other sign or symptom, the first manifestation of malignancy, that it should never go by unnoticed. Malignancy in the urinary tract, as in other parts of the body, can only be eradicated by early discovery.

An abdominal mass which cannot definitely be explained, a röntgenographic shadow in the region of the urinary tract, indefinite pains possibly referable to the urinary organs, all require a thorough urological study of the patient.

It is impossible in a limited space to cover even briefly but a few of the many urological problems facing us, in the solution of which decided advance has been made, owing to early recognition, thorough understanding of the lesion and perfected means of coping with them.

OBSTRUCTION OF THE VESICAL OUTLET.

While obstructions of the vesical outlet do occur in the female, such obstructions are usually inflammatory and are relieved by dilatation, cauterization of the vesical neck and urethra and elimination of a focus of infection higher up.

Obstructions of the vesical neck in the male past middle age are due to prostatic obstructions in the majority of cases, congestion without hypertrophy, acute infection, prostatic abscess and nerve lesion accounting for but few instances.

Prostatic obstruction resolves itself into three classes: Contraction of the vesical neck or fibrous prostate, hypertrophy and carcinoma. Our present methods of coping with each class represents one of our greatest advances in modern urology. One of the clouds of advancing years in the male has been the fear of interference with the function of urination. This fear has been based upon fact. The inconvenience and later suffering, with the slowly progressing pathological condition of the immediate organ involved, as well as secondary changes in the upper urinary tract and general systemic impairment, gives a picture with which you are all familiar. The relief from catheter life with its constant inconvenience, suffering and certain end, or operation with former high mortality and possible permanent complications at one time led one to wonder if the treatment were not as bad as the disease.

The picture has been changed. The man of advancing years who begins to complain of increasing frequency of urination and difficulty in starting the stream, who arises at night to void, should have the advantage of a urological examination. Not that all such men require radical procedure. In recently reviewing a series of cases for a period of one year, I found, of 204 male patients with urinary symptoms, that only fifty-four men were in the surgical class, and but thirty-three required immediate operative intervention; often, however, with slight symptoms, a well marked hypertrophy is present, which may be removed before the bladder and kidneys are permanently damaged and secondary constitutional changes, which are sure to follow, are avoided. Secondly, and of ever increasing frequency, a carcinoma of the prostate is detected. Unfortunately, symptoms are usually absent or slight until prostatic cancer is advanced. Only by the early discovery of cancer are we able to cope with this most difficult of all urological problems.

Briefly, why are we in this difficult position regarding the radical cure of these cases of prostatic obstruction? In the operative class this change has not been brought about by means of a slight of hand operation but because we study the patient, prepare him for the operation, perform the operation in such a manner as to cause the least amount of shock, and take care of him after operation. The preparation may be summed up as a period of stabilization of a disorganized systemic condition; circulatory, urinary and gastrointestinal systems must be built up under the changes brought about by the relief of urinary back pressure by bladder drainage. When the patient is on an even keel, the removal of the prostate through a drainage wound with paper control of hemorrhage should be attended by little constitutional reaction, and under present improved methods of subsequent bladder drainage, the convalescence should be rapid and comfortable, the functional result perfect. The attendant mortality is surprisingly low. Series of cases have been reported by Gardner of 125 consecutive cases of prostatectomy without a death, by the suprapubic route, and by Young, of 165 consecutive cases of prostatectomy without a death by the perineal route. My own mortality in all cases to date, extending over a period of sixteen years, is 2.2 per cent.

While it may be possible to carry a large series of consecutive cases through this period of regeneration without a death, we are operating upon old men in the presence of serious complications and certain fatalities will occur, such as pulmonary embolus, and a certain mortality must result. The point is that in no other class of surgical cases, with so many complications to cope with, has the mortality rate been reduced to anything like that of prostatectomy.

Individual cases of fibrous prostate may best be treated by prostatectomy, but the majority of patients with small prostate or contraction of the vesical neck, are satisfactorily relieved by the removal of sections of the constricting ring, transurethrally under a local anesthetic by means of "prostatic punch." Recurrence of the contraction may rarely occur, requiring a repetition of the socalled punch operation. All such patients should be kept under observation.

Cases of prostatic cancer require the most careful study. As stated, symptoms are often delayed until, with the first manifestation of urinary disturbance, malignancy is found far advanced. The first phase of the study should be to determine, if possible, the presence of metastasis. A complete study of body functions and of the bones with x rays is necessary. If metastasis is present, little can be done other than to relieve urinary retention by the partial removal of the prostate, by limited use of radium or by permanent suprapubic drainage.

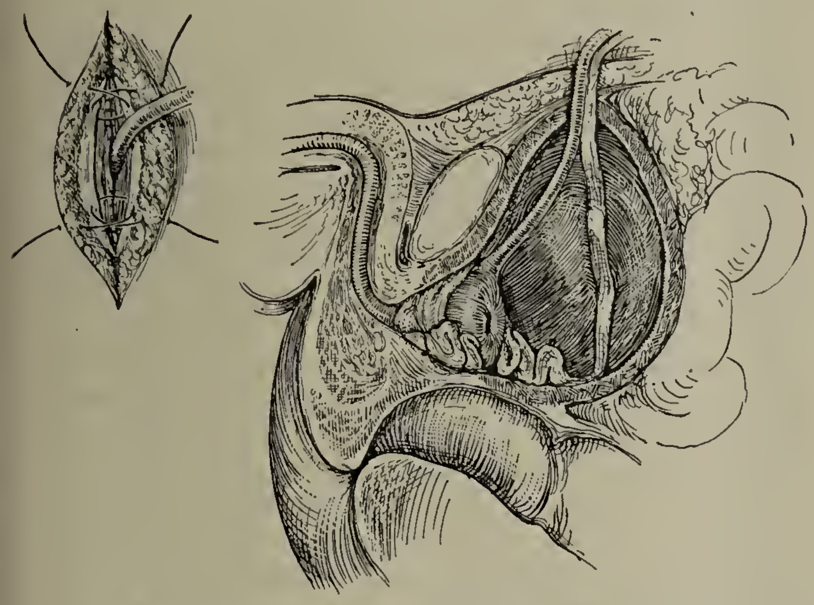

Fig. 1.—Method of controlling hemorrhage following prostatectomy. Packing is carefully placed about the Pilcher bag. Insert shows method of closure of abdominal wound after suprapubic drainage.

If the cancer is limited to the prostate, removal may be indicated in some cases, while in others relief and possibly a cure will be obtained by the introduction of radium into the prostate by means of needles passed into the gland through a suprapubic cystotomy wound, others through the perineum, and by means of surface applications of radium to the rectal and urethral aspects of the prostate.

The immediate changes obtained from this procedure are distinctly encouraging. By proceeding with caution, always attempting to destroy the growth, not the patient, we hope in several years to be able to talk of results. Our hope lies in early recognition of the lesion.

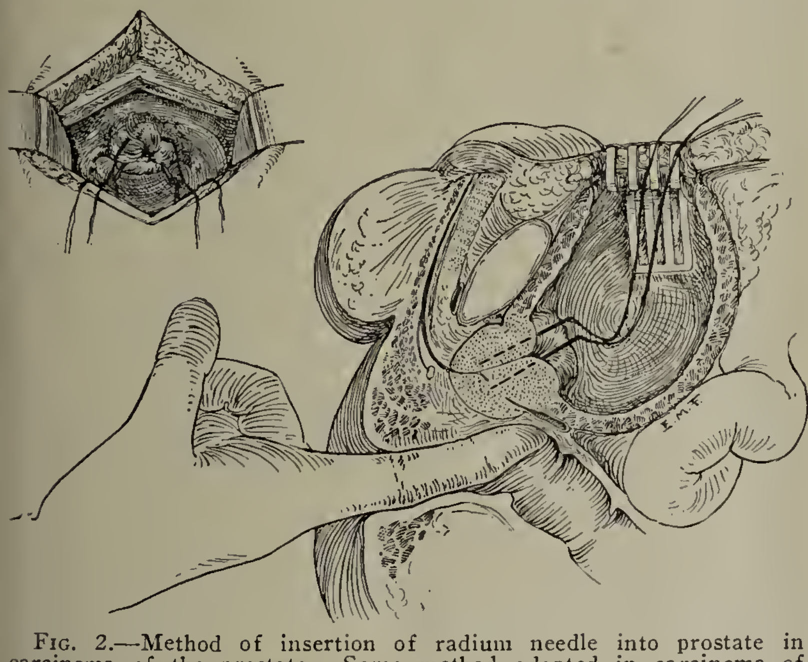

Fig. 2.—Method of insertion of radium needle into prostate in carcinoma of the prostate. Same method adopted in carcinoma of the bladder.

TUMORS OF THE BLADDER.

Our second most difficult problem in urology has been the treatment of the bladder tumors, the more intense study of which was greatly stimulated by the introduction and success of fulguration, applied through the cystoscope, as a means of destruction. It was soon found that this method was applicable only to benign vesical growths. The use of x rays, diathermy and radium were next taken up in hopes that singly, or in combination with surgery, some means of cell destruction might be added to the often futile attempts at removal of the tumor with subsequent rapid recurrence and death, as shown by operative statistics.

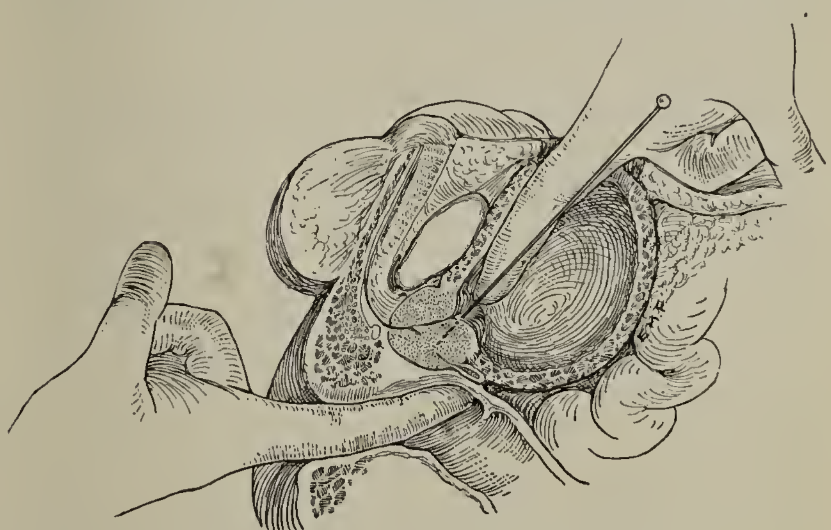

Fig. 3.—Method of reinsertion of radium needles into prostate in carcinoma of the prostate. Same method adopted in carcinoma of the bladder.

The use of x rays and diathermy in attempted destruction of bladder growths was a disappointment. Of late, by the use of more powerful machines with deeper penetration, there has been a revival of interest in the use of x rays in this field. The work is still highly experimental and clinical reports of cases in sufficient number and observed over a proper length of time, will be awaited with much interest and hope.

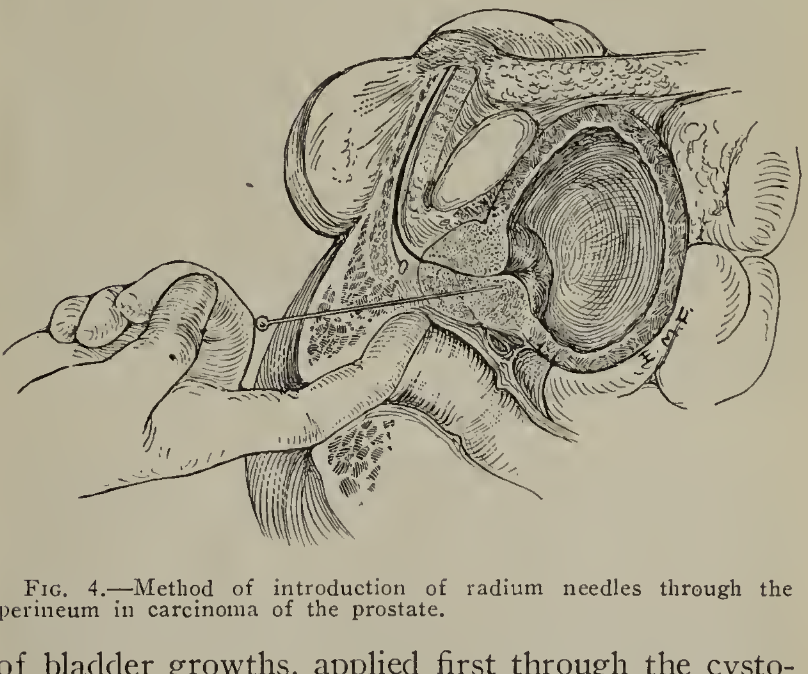

Fig. 4.—Method of introduction of radium needles through the perineum in carcinoma of the prostate.

Radium was taken up as our agent of destruction of bladder growths, applied first through the cystoscope to the surface of the growth, and latterly introduced into the tumor through a suprapubic opening. When applied to the surface of the growth by cystoscopic methods, there was always a question of the nature and extent of the growth, discomfort and irritation accompanying or following the application and inability to reach the deeper structure.

It is now our custom in a papillomatous growth to attempt fulguration. If the growth does not respond at once, it is considered malignant and further effort along this line may stimulate the growth or valuable time lost to other methods which might bring about a cure.

The bladder is opened and if possible, as with cancer in any other part of the body, the growth removed, radium needles being inserted into the bladder wall about the line of suture. In all of the bladders I have opened for growth during the past two years, the tumor has proved to be in whole or part malignant. While it is possible in many cases to resect a bladder with an apparently wide margin of healthy tissue, we found in one case cancer cells extending along the muscle bundles to the edge of the line of resection with no superficial evidence of growth. The fortification of the line of resection in the immediate location of the growth with radium may help to avoid recurrence. It causes a localized sloughing which lasts three or four months, has given no untoward results and there have as yet been no recurrences in six cases so treated. In two cases of localized infiltrating cancer where a resection could have been done, the growth was not excised but entirely destroyed by the repeated introduction of radium needles through a suprapubic sinus. Extensive, infiltrating carcinoma was destroyed in this same manner in six cases where resection was impossible; four of the patients are free of growth and two subsequently died of general metastasis. Two recent cases of extensive infiltrating growth show marked retrogression of the growth; these cases give us encouragement.

Obviously little can or should be done for an extensive infiltrating cancer of the bladder with metastasis other than to try to make the patient more comfortable, possibly by permanent drainage.

Radium is an important accessory to surgery but must be used with caution. Cancer tissue must be destroyed slowly, for toxemia always results and too rapid or strenuous application will destroy the patient more rapidly than the growth. By proper study of individual cases, before instituting any line of treatment, especially as regards the presence of metastasis, applying fulguration surgery, radium or a combination of methods, carefully watching the patient after operation that recurrences, which, when detected early, are often easily destroyed by fulguration or radium—far better results are going to be obtained in the future in this once almost universally fatal class of cases.

URINARY INFECTIONS.

A subject about which books could be written can only be touched upon lightly in a paper such as this. I have already alluded to the question of the supply of bacteria to the urinary tract and the rôle of focal infections and gastrointestinal function in this connection. Much has been written of late regarding focal infections, and their important bearing upon urinary infections has been further demonstrated by valuable experimental work. The recent researches carried out at the Mayo Clinic, in which urinary calculi have formed in the kidneys of seventeen animals following the injection of bacteria into the gums about the teeth, is convincing. One of our greatest proofs of this close connection is the clearing up of urinary infections in many instances by the elimination of focal infections and regulation of gastrointestinal function without any special treatment directed to the urinary tract.

Of some of the pathological lesions found in the urinary tract that predispose to infection, I wish to speak briefly. Pockets in the prostate and seminal vesicles enlarged or atonic from congestion or venereal infection, are often the site of subsequent invasion and should always be studied carefully in connection with a urinary infection. Obstructions of the vesical neck have been mentioned, also the manner of dealing with them.

A bladder condition found much more commonly than it was previously supposed to exist both in children and adults is diverticulum. A pocket so large that it forms a veritable second bladder may be present for years and not be detected until an infection supervenes. The anomaly, congenital in origin, is detected on cystoscopic examination and relieved only by the removal of the sac.

Central nerve lesions with consequent interference with bladder function predispose to infection and must be borne in mind.

Studies in the selectivity of bacteria have shown an apparent affinity of certain strains of organisms for the bladder. Urine containing often more than one type of bacteria will occasionally show localized patches of cystitis, which, if allowed to advance, result in ulceration. This ulcer, termed elusive by Hunner, gives rise to distressing symptoms. The first dictum as to treatment gave resection of the bladder as the only cure. Subsequent observations have modified this stand to the extent that a recent statement by the first writer on this subject was that of thirty cases observed in the past year, none of the patients had been operated upon. Elimination of focal infections and local treatment of the bladder lesion by topical applications or fulguration is giving satisfactory results.

Pericystitis—contact of the bladder with an outside inflammatory process causing inflammation of the bladder by direct invasion—may be the etiological factor in occasional resistant, obscure bladder infections and should lead to more careful pelvic examinations. The presence of a calculus or foreign body in the bladder should always be borne in mind. The diagnosis is simple and removal often accomplished by cystoscopic methods.

The ureters play an important part in urinary infections. As conduits of small calibre, with definite points of narrowing; loosely attached; with a heavy, more or less movable kidney above, and an often times irritating fluid passing through them, they are easily kinked, constricted by pathological narrowing, and displaced, thus decidedly interfering with kidney drainage; and must be taken into account in eliminating kidney infection. This is beautifully demonstrated by introducing a ureteral catheter into a kidney pelvis in a case of pyelonephritis of pregnancy. With the establishment of kidney drainage the picture changes at once and in conjunction with general measures, often the infection disappears rapidly.

Ureteral calculus is of far more common occurrence than is generally supposed. In any case of severe abdominal or pelvic pain, or continued obscure abdominal symptoms, the presence of a stone in the kidney or ureter should be suspected. Although its presence is not always detected by the röntgenogram, cystoscopic methods at our disposal should bring it to light.

By means of the pliable ureteral catheter and bougie, the injection of a solution opaque to the x rays outlining ureter and kidney pelvis, and röntgenograms of the patient in prone and erect positions, we should obtain the necessary information to make a diagnosis of ureteral lesion, kidney lesion, malposition, or congenital anomaly, conditions which must be recognized that treatment may be instituted.

Prolapsed kidney is one of the most common predisposing causes of renal infection. The resulting urinary stasis and congested kidney are fertile soil for bacteria, and while seldom a surgical entity, the malposition must be taken into account. That the prolapsed kidney is most often the site of pyogenic infection, tuberculosis, stone and even growth is a matter for serious consideration.

While our problems in urology are many, and the field is farreaching, we are not working as once in obscurity, and with the enlightenment derived from accurate methods of observation and study which has led to decided advances in treatment, the plea of the urologist today is an opportunity to relieve the patient in the early stages of the lesion when radical procedures may be avoided; or to apply radical measures of relief before secondary permanent damage has resulted; and in the case of malignancy while the growth is localized.

40 East Forty-first Street.

Prevention of Venereal Disease*

By H. WANSEY BAYLY, M.D.,
London.
Honorary Secretary and Representative of the Society for the Prevention of Venereal Disease.

It is, I think, universally agreed that all contagious diseases that are communicable by direct contact and consequent direct inoculation with the virus, may be prevented from developing by the immediate application of a suitable disinfectant to the site of the inoculation. It is also, I think, universally agreed that the plagues and pestilences that devastate, or have devastated, the human race are being conquered, or have almost been conquered, by preventive rather than curative medicine, and leprosy, yellow fever, malaria, smallpox, typhoid, and typhus, leap to the mind as brilliant examples of success, partial or complete, achieved by preventive medicine. It is also, I think, universally agreed that curative medicine holds out little hope of markedly diminishing the incidence of widespread infectious diseases.

Of all such widespread pestilences that have demanded, or still demand, a heavy toll of human life, venereal disease alone has up to the present received scant attention from preventive medicine.

Lord Astor, in the report of his interdepartmental committee in the autumn of 1919, made certain statements in Clauses 12 and 13 of this report, which although only signed by Lord Astor himself on behalf of the committee whose names were not mentioned, would almost certainly be taken as representing authoritative medical opinion of this country. As such opinions appeared to me to be at variance with the opinions of the leading authorities who had had practical experience in the prevention of venereal disease, it seemed to me urgently necessary that some protest should be raised, and I felt that the time had come when it was essential for the health of the nation, and for the honor of the medical profession, that these statements should not be permitted to pass unchallenged and that the value of preventive medicine should be insisted on.

The statements referred to above were:

Clause 12: 1. Certain drugs if properly applied are efficient in preventing venereal disease. 2. That if not properly applied their efficacy cannot be relied upon. 3. The issuance of packets tends to give rise to a false sense of security. 4. Packets are used for selftreatment. Then follows an expression of opinion that "the true safeguard is individual continence and a high standard of moral life."

Clause 13 contained the following paragraph:

"Unquestionably there have been many individual cases which appear to afford positive evidence in favor of a system of distribution of such prophylactics before exposure to infection, but the volume of such evidence is too small and too exceptional and the instances of its failure, even under favorable circumstances, are too numerous to allow of any other conclusion than that in view of the considerations mentioned above, and of the administrative and social difficulties involved, the official application of the packet system to the civilian community is neither desirable nor practical."

These statements, while acknowledging the truth of the scientific fact that immediate selfdisinfection is efficacious, at the same time offer the opinion that it was useless to attempt a practical application of the scientific basis, appeared to me so contrary to the whole history of scientific advancement that I resolved to endeavor to unite into one society all those distinguished members of the medical profession, the press, the nursing profession, and social workers, who had individually for many years lifted up their voices in the wilderness and preached to an unhearing world the gospel of cleanliness and personal hygiene as a method of reducing venereal disease.

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*Address delivered at the Plymouth Congress of the Royal Institute of Public Health, June 5, 1922.

In less than three years the truth of the scientific principles that venereal disease can be prevented by the immediate application of a suitable disinfectant is universally acknowledged, and the practicability of general application of this scientific principle is now the only point seriously raised by our opponents. The chief credit is due to those sturdy pioneers who first raised the flag in the campaign many years ago, and the names of Dr. H. N. Robson, Sir Bryan Donkin, and Sir Archdall Reid, will, I think, be remembered with gratitude by many generations yet unborn. To Professor Metchnikoff, of the Pasteur Institute, who first clearly demonstrated the scientific fact that syphilis could be prevented from developing after inoculation by the application of a suitable disinfectant, a specially honored niche in the history of preventive medicine will be given, and to Lord Willoughby de Broke will be given the honor of first raising the question in the House of Lords. My small part has only been to realize the importance of organization, and to do the little that I could to unite individual opinion into a society, whose voice could not be disregarded.

I will now crave your indulgence in permitting me to place before you a few of the facts on which the policy of immediate selfdisinfection is based.

Before the war the First Battalion of the Yorkshire Regiment was at a hill sanatorium in India, where there was no venereal disease. It was ordered to Delhi, a notorious hotbed of these disorders, and the commanding officer, in alarm, consulted with his medical officer, who advised, merely advised for he had no power, his charges to carry pill boxes containing crystals of permanganate of potash, and to make a solution and swab themselves carefully after incurring danger. During four years that battalion had only six cases of venereal disease. About the same time and by similar means venereal disease was reduced at Mhow, another Indian station, to negligible proportions.

During the war, in Egypt, Sir James Barrett, operating on an immense scale among the Australians, of whom he was in medical charge, also reduced venereal disease to almost negligible proportions, and wrote, "In my experience primary prophylaxis has been practically certain in its results," and quotes the results obtained: In one camp through which 9,282 troops passed 4,400 reported exposure to infection, and as the result of primary prophylaxis only thirteen infections resulted.

Between April 1, 1918, and March 31, 1920, Surgeon Commander H. Boyden, then in medical charge of the Naval Gunnery School at Portsmouth, supplied 923 bottles of one in a thousand solution of permanganate of potash to men who intended to incur danger. Only one man was infected, and he, disregarding instructions, disinfected, not immediately, but six hours after the event. During 1917, the men at the Royal Artillery Barracks at Portsmouth were carefully instructed to disinfect without delay. Out of 3,750 men, only five were infected in nine months. On January 1, 1917, Sir Archdall Reid, then medical officer in charge of 2,000 troops at Portsmouth, began to teach his men immediate selfdisinfection with permanganate of potash, with the result that the venereal disease rate among his men fell from ninety-two in a thousand per annum to 1.5 in a thousand per annum. Many other instances could be produced in which venereal disease has been reduced to the vanishing point merely by teaching men to disinfect without delay.

The practical application of the scientific principle of disinfection has therefore been proved in certain instances. Why has it failed in other instances? It has failed only where there has been faulty teaching, and when failure, as the result of faulty teaching has resulted, the failure has been attributed to disinfection, and not to the faulty teaching of the true scientific principle.

I had the honor to serve as a medical officer in the Navy and in the Army during the whole of the war, in the latter as medical officer to infantry, cavalry, and artillery, and with field ambulances and military hospitals. In the whole of my service, whether at home or overseas, in no single instance was I or the unit of which I was in medical charge, ever visited, inspected, or interrogated in regard to the prevention of venereal disease by personal disinfection. Whether the men were taught the scientific principle of disinfection or not was entirely according to the discretion, energy, knowledge, and enthusiasm of the medical officer, and certainly not one medical officer in a thousand bothered about it at all. When a medical officer would interest himself in disinfection, venereal disease vanished from the unit.

I cannot help feeling that Colonel L. W. Harrison, who at one time was a pioneer preacher of disinfection, would have been wiser to have inquired more fully as to the reasons of failure of disinfection in the Army before he ventured on apparently quite insufficient data and evidence, to attribute such failure to the impracticability of teaching and persuading soldiers to carry out intelligently and efficiently the simple technic required for immediate selfdisinfection. The high incidence of venereal disease in the Army as a whole, both during and since the war, and the extremely low incidence in certain units in the Army, both during and since the war, are not antagonistic evidence, but clearly circumstantial evidence that:

1. Venereal disease can be greatly reduced by immediate selfdisinfection when the necessary knowledge is simply, clearly, and definitely given, supported by authoritative opinion, and stress laid on the essential and cardinal points of prevention, disinfection, and promptitude as compared with cure, treatment, and delay.

2. Venereal disease will not be reduced if no adequate steps are taken to insure by personal inspection and interrogation that the medical officer is imparting such knowledge to all the officers, noncommissioned officers, and men under his charge, and especially if he allows confusion to arise in their minds by advice and orders illogical and contradictory in wording and administration. For example, calling disinfection, early treatment; disinfection depots, early treatment centres; and disinfection outfits, early treatment outfits; and in the same breath insisting on the importance of promptitude in application, and failing to impress the importance of conveying the disinfectant on the person, which is the only certain way of ensuring such promptitude in application, but, on the contrary, advising the repair to a blue light depot on returning to camp.

The sailors, the soldiers, and the civilian population of this country are not unintelligent, and the persons whose intelligence is so low as to be unable to carry out the very simple technic of immediate selfdisinfection, when properly explained to them by lectures and pamphlets, must form an extremely small minority. The people of this country, whether naval, military, or civilian, can recognize as well and often better than eminent politicians an atmosphere of insincerity, and when instructions and orders are contradictory. Small wonder then when the majority of the Army received no instructions in immediate selfdisinfection, and often next to no instruction in delayed disinfection camouflaged as early treatment, that the venereal disease incidence was, and is, high in the Army as a whole. Small wonder that the incidence of venereal disease is high among the civilian population, who have no opportunity of acquiring knowledge concerning immediate selfdisinfection, except from the society that I represent, and through twenty-one county and borough councils throughout the country who have had the courage to adopt the policy recommended by my society.

Unfortunately, the propaganda of my society has been necessarily very limited, as we are dependent on the subscriptions of our members, and such donations as we are able to obtain from the philanthropic public, which in these days of depressed trade are scarce. Our propaganda, therefore, is practically confined to occasional articles and correspondence in the press, and addresses by myself to health committees, and bodies specially interested in the advancement of national health and prosperity, and to branches of trade union organizations.

Unlike the National Council for Combating Venereal Diseases, who have considerable financial resources at their command both by grants from the Ministry of Health and the Colonial Office, and grants by local authorities to their local branches, my society has no such funds, so that we are unable to advertise in the press, or to pay lecturers, or to convene public meetings. The majority of the people of this country have therefore heard only one side of the question, the side of the National Council for Combating Venereal Disease, but the knowledge of immediate selfdisinfection is abroad, it is spreading from mouth to mouth, this knowledge can no longer be withheld, and the demand for it is insistent. I have given addresses before nearly one hundred trade union organizations, and every one of them without exception has expressed enthusiastic support of the policy of my society.

I think it must be universally acknowledged that delayed disinfection, sailing under the false colors of early treatment, has utterly failed, and indeed if it had been in any way successful it would have been a matter of astonishment and wonder, particularly as no medical officer with any memory of scientific training could possibly be enthusiastic in preaching such hoodwinked hygiene and such shackled science as that disinfection was good if not called disinfection and if delayed, but bad if given its correct label and selfapplied immediately after risk. When immediate selfdisinfection has been intelligently and intelligibly placed before groups of men of average education and intelligence, conspicuous and astonishing success has been achieved, but alas, the majority of men have not been able to obtain access to such straight talk, and have had to listen to halting sermons that could have no possible results but failure, and that lacked both courage and trust.

I will now present the official statement of the policy of the Society for the Prevention of Venereal Disease

PREAMBLE.

The Society for the Prevention of Venereal Disease takes its stand upon three main principles.

The first is that it is the duty of every good citizen, man or woman, to live a chaste life. He or she who violates the law of personal chastity not only commits a sin, but does injury to the Nation and the Empire.

Secondly, it is the office of medical science to prevent the consequences of sexual immorality. There is no doubt that venereal disease is a cause of widely spread suffering among all classes. The Royal Commission on Venereal Diseases made the following statement: "While we have been unable to arrive at any positive figures, the evidence we have received leads us to the conclusion that the number of persons who have been infected with syphilis, acquired or congenital, cannot fall below ten per cent. of the whole population in the large cities, and the percentage affected with gonorrhea must greatly exceed this proportion." It is impossible to overestimate the evil of such diseases prevailing on so large a scale. For the tragic fact in sexual immorality is that its consequences are not limited to the persons who commit it, but they pass to innocent women and children who are in no manner or degree responsible for it.

Thirdly, the society holds that venereal disease can be prevented by immediate selfdisinfection, provided it is intelligently applied. Immediate selfdisinfection, like many other preventive measures, may be occasionally inoperative through misuse or delay. But this fact is not an argument against its efficacy, and only strengthens the hands of those who desire to instruct the public in its proper application. The society also insists upon the obligation of seeking and testing further new measures of prevention.

The society looks with favor upon all curative measures in respect of venereal disease, and heartily approves the institution of venereal clinics.

The doctrine that the sins of the fathers are visited upon the children cannot be held to be a reason for forbidding the alleviation of human suffering; and it is opposed to the example of Him who said "Behold thou art made whole; sin no more, lest a worse thing come unto thee."

The Society for the Prevention of Venereal Disease teaches that instruction in the methods of selfdisinfection should not be refused to men who have reached adolescence, to adult women if they desire it, or even to younger persons at the discretion of their parents or those responsible for their welfare. It advocates the propagation of such knowledge as may tend to diminish venereal disease and its grave consequences by lectures and leaflets, assuming that in general the lectures are attended and the leaflets received by such persons only as have reached the age of adolescence. It wishes also to keep an open mind for all such social and medical developments as may tend to the extirpation of the scourge which has so long afflicted humanity.

POLICY.

1. To instruct the public as to the great importance of selfdisinfection at the time of exposure to risk as a preventive of venereal disease, and the methods of application of such disinfectant.

2. That such instruction should be given only to men above the age of eighteen, to adult women on demand, and to younger persons in special cases at the discretion of those responsible for their welfare.

3. To insure the sale of the disinfectants required, together with full instructions to such persons, but to such persons only.

4. That instruction regarding the nature and application of such disinfectants should be conveyed to such persons:

   1. By leaflets supplied with the disinfectants at time of sale, and by attendants at public conveniences on demand.
   2. By lectures.
   3. By medical officers of venereal clinics.
   4. By officers or officials in charge of naval, military, and industrial units.

5. To advocate such further steps for the prevention of venereal disease as may from time to time be deemed advisable by the executive committee .

The society was founded to emphasize the value of medical prevention, which was not referred to the Royal Commission of Venereal Disease, and has largely been omitted from the propaganda of the National Committee for the Control of Venereal Disease, but I take this opportunity of stating most emphatically, as I have always stated most emphatically in press and on platform, that we recognize that immediate selfdisinfection is only one of the many weapons which we possess to fight this plague, and that we entirely endorse and acknowledge the value of other methods. As, however, the Society for the Prevention of Venereal Disease was founded with the object of filling in the gap left open in the propaganda of the National Committee for the Control of Venereal Disease by their opposition to the widespread teaching of immediate selfdisinfection. my society has confined itself to this aspect of prevention, having full confidence that the good organization and ample financial resources possessed by the National Committee for the Control of Venereal Disease would enable it to carry out more efficiently than we could the other methods of prevention which it advocates, and which we endorse.

It has been a great source of satisfaction to me to note that during the last year the opposition of the National Committee for the Control of Venereal Disease to immediate selfdisinfection that was formerly so pronounced has greatly diminished. This first advancement of the National Committee for the Control of Venereal Disease toward a common policy with my society was first observable when the National Committee for the Control of Venereal Disease recommended immediate selfcleansing, for it was clear that the gulf between cleansing and disinfection was a narrow one, which might be abridged at any moment. Later it emerged that the National Committee for the Control of Venereal Disease had now come to regard potassium permanganate with greater favor, and the following quotation from a recently published booklet by Sir Leslie Mackenzie, member of the Scottish Board of Health, issued by the Scottish Committee of the National Committee for the Control of Venereal Disease, brings the two societies almost into line. On page 18 of this booklet there is the following instructive statement: "It is absurd to say that there is any danger in teaching every person capable of being taught that the venereal diseases are each of them due to a definitely known germ; that so long as the germ lies on the surface, it can be destroyed with a mild disinfectant, or even mechanically removed by soap and water without much trouble; but that, when one of those germs enters the channels of the body and infects the lymphatic glands or the blood, the destruction of the germ, which is another name for the cure of the disease, becomes in at least two of these diseases a matter of extraordinary difficulty, and demands high technical knowledge and skill. In teaching these facts, we are teaching things so simple that any person can understand enough of them to realize the danger of spreading the diseases, the easiness of the methods of preventing them, and the difficulty of curing them once they are acquired."

Dr. E. Clarkson, a member of the executive committee of the National Committee for the Control of Venereal Disease, in his book, *The Venereal Clinic,* acknowledges this change in attitude of the National Council, and says on p. 374: "The National Committee for the Control of Venereal Disease has fundamentally moved from its original position to one which is practically shared by the Society for the Prevention of Venereal Disease. Let this fact be honestly acknowledged, and let controversy lead to the amity of union. The National Committee of the Control of Venereal Disease has evidenced a marked ability in the education and administrative sphere. Let it continue to exercise this, while the Society for the Prevention of Venereal Disease develops on still broader lines the medical policy for which it is eminently adapted. Where true correlation exists, no clashing nor collision need be. The gain that will accrue to Britain will spread to the world beyond."

These words by Dr. Clarkson so impressed me that I laid them before my executive committee, who unanimously invited Dr. Clarkson to join our executive committee, which invitation I am pleased to say he felt himself able to accept. The Society for the Prevention of Venereal Disease at its foundation was almost entirely confined to medical members as regards our vice-presidents and executive committee, but we soon found that we were being falsely called the Amoral Society by our opponents, and we therefore gratefully accepted the support and help of prominent ministers of religion.

Having stated to you in brief our policy and the evidence on which it is founded, perhaps I may now be permitted to lay before you the criticisms advanced against our policy, and our reply to such criticisms, and for this purpose I will read you the manifesto published widely in the medical and lay press by the National Committee for the Control of Venereal Disease in November and December last, and replied to by us also in the press. I will, with your leave, deal with the criticisms brought against us *seriatim.*

Paragraph 1 stated that even if immediate selfdisinfection had been successful in the Navy and Army that it was obviously impossible similarly to instruct the civilian population, as what is practicable in disciplined forces is impracticable otherwise. The reply to this is that the instructions given to the men were not forced on them, and that no penalty was attached to the neglect of the instructions, and that as exposure to risk invariably occurred during an off duty period that the question of discipline did not arise.

Paragraph 2 consisted of quotations from the largest clinic in London (Lock Hospital) stating that about twenty-five per cent. of subjects treated for venereal disease had used immediate selfdisinfection, and deducing therefrom the failure of immediate selfdisinfection unless extremely carefully carried out. A similar inquiry had been carried out by Dr. Sequeira at the London Hospital, where about one in five patients were found to have used some disinfectant, but practically none were able to state the strength of the solution applied, and very few had received the necessary instructions for application. Also of this twenty per cent. it was found that the majority had only applied the disinfectant after the last of a series of exposures to risk. The fact that in both inquiries from seventy-five to eighty per cent. had applied no disinfectant certainly does not appear to be any evidence against the value of disinfection, and the increase in attendance at venereal clinics in 1920 did not prove the inefficiency of immediate selfdisinfection, the knowledge of which was limited to a very small section of the public, but it does prove the inefficiency of the national council's expensive efforts to stem the disease, which have had a prolonged trial and well organized publicity. The fall in the increase of attendance at venereal clinics during 1921, occurring as it did after the controversy had been pursued in the press for over a year, may perhaps be accounted for by the spreading knowledge of immediate selfdisinfection.

Paragraph 3 of the national council's manifesto states the opinion of certain German delegates to the Red Cross Conference at Copenhagen in May, 1921, that there was no evidence of diminution in the number of cases of venereal disease, and no sign of any fall in its incidence, in spite of the fact that immediate selfdisinfection had been extensively carried out in Germany during the last six years.

There are two answers to this point: 1. That the Society for the Prevention of Venereal Disease, owing to the action of the National Committee for the Control of Venereal Disease, was not represented at the conference, and that the whole question of immediate selfdisinfection was not thoroughly explored. 2. That the most prominent antivenereal society in Germany, the D. G. B. G., expressed at its nineteenth annual meeting last year, with Professor Blaschko in the chair, its very decided opinion, 1, that instruction in prophylactic disinfection after intercourse ought not to be neglected; 2, that it is the duty of the public to see that adequate provision is made for selfprotection; 3, that personal prophylaxis should be taught at ablution centres; 4, that the vital importance of time as a factor in disinfection should be taught by means of placards showing diagramatically by black vertical columns that the effectiveness of disinfection diminishes as the interval between intercourse and disinfection increases; 5, that every effort should be made to render these selfprotection devices as accessible to the public as possible. Professor Blaschko ended his speech by saying that he had found disinfectants were more prone to remind men of the dangers of sexual escapades than to create a sense of security, and that he believed that the more energetically we impress upon the public, and young males in particular, the need of selfprotection the more will this danger be appreciated, and this appreciation will act as a check on many persons. From which I think it is clearly shown that the German delegates at the Red Cross conference did not represent the authoritative medical opinion of Germany if they opposed immediate selfdisinfection.

Paragraphs 4 and 5 of the national council's manifesto make the extraordinary suggestion that, because there had been an increase in Dresden of venereal disease infection among boys and girls between fourteen and eighteen coincident with propaganda regarding immediate selfdisinfection, that immediate selfdisinfection was therefore not only of no value but dangerous. Our reply to this is that both the widespread propaganda in venereal disease, and the increase in venereal disease in boys and girls of this age were due to the wave of sexual license which has swept through Germany since the war; and that even if it is impracticable to teach efficient selfdisinfection to boys of this age that this is no argument whatever against the value of disinfection, as in this country at any rate the number of boys contracting venereal disease between these ages is extremely small, and would not materially affect the value of the method. During four years at the London Hospital only one per cent. of the cases of venereal disease occurred under the age of eighteen.

Paragraph 6 contains the old plea that the carriage of disinfectants on the person will be a continual incitement to illicit intercourse. This is entirely a question of opinion, and as I have pointed out, Professor Blaschko holds the contrary opinion.

Paragraph 7 states that because immediate selfdisinfection with the majority of women is unsatisfactory, that therefore the method is of little value. It is, however, clear that in a sex disease if the disease is limited in one sex it is limited in an equal degree in the other, and here I wish to repudiate with some just anger the suggestion that my society concerned themselves more with the protection of men than of women. On the contrary, the protection of women and children was very near my heart when I determined to found the society, and the protection of women and children is the most burning desire of every member of my executive committee, of the women's committee, and of each member of the society. After prolonged inquiry and debate, and council with the clinical committee of the society, we arrived at the conclusion that the most certain way of protecting women and children was by breaking the chain of infection at its weakest link, which was in the male immediately after exposure to risk, and it was for this reason alone that we have primarily concentrated our efforts to the prevention of venereal disease in men, recognizing as we do that the prevention of venereal disease after risk is much more difficult in women, so much more difficult as to be impracticable except in a small and limited class.

Paragraph 8 is difficult to treat seriously, and runs: "Notwithstanding any warning given, a certain number of individuals in whom the diseases may have developed, will persist in using the disinfecting materials as a means of treatment. By so delaying the use of true remedial measures, they will prolong the period of infectivity to others, and of treatment necessary for cure of themselves."

This paragraph, coming as it does from the organization very largely responsible for this confusion by their antagonism to the use of the words prevention and disinfection and by their continual use of the words early treatment for disinfection, can only be taken as a not uncommon method of defense of an exceptionally weak spot by an attempt to hide weakness by attack.

Space does not permit me to detail to you the extremely encouraging support we have received from prominent members of religious denominations, which include well known names of English Churchmen, Roman Catholics, Wesleyans, and Jews; from commerce as represented by the Shipping Federation and the British Humane Association; from political parties, the press, and labor organizations. That the importance of the medical prevention of venereal disease is now appreciated is apparent from the inquiry taking place before Lord Trevethin's committee, of which the terms of reference are: "To consider and report upon the best medical measures for preventing venereal disease in the civil community having regard to administrative practicability including cost."

There can, I think, be little doubt that the controversy which has raged between the National Committee for the Control of Venereal Disease and ourselves since the autumn in 1919 has served a very useful purpose, and has produced a publicity which would otherwise have been difficult if not impossible to obtain, but I feel deeply that the time for controversy has passed, and that the time for conciliation and unity has arrived. It now appears that the point of difference between the two societies, now that the principle of immediate selfdisinfection has been accepted by both, has been reduced to the academic point as to which of several methods of prevention, all of which are agreed to be valuable, is most important.

Portsmouth, Chatham, and Liverpool have all recognized the importance of disinfection, and it would indeed be appropriate if the name of the ancient Port of Plymouth, associated as it must ever be in the minds of Englishmen with the spirit of patriotism, courage, and unflinching duty, should be able once again to take a prominent part in conquering a national enemy, and in establishing a new world. The enemy we are fighting is more potent and more terrible than that with which Drake had to contend, and the land of health we wish to establish demands pilgrims with as high ideals and with as much stern common sense as did America.

I appeal, therefore, to the National Committee for the Control of Venerable Disease, whose valuable work in educating the public as to the terrors of venereal disease and the importance of adequate treatment after infection I most freely acknowledge, to accept officially immediate selfdisinfection as one weapon in the antivenereal campaign. With such official recognition from the National Committee for the Control of Venereal Disease of the importance of immediate selfdistinction, every obstacle to cordial cooperation between the two societies disappears, and the door is opened to a coalition of the two societies, a coalition in which each society would work along its own lines towards the common goal, and in which each member of the coalition would support the efforts of the other.

Report of a Case of Accidental Occlusion of the Male Urethra

By WILLIAM BISHER, M.D.,

New York.

The patient was a healthy baby boy five months old who had not been circumcised. He had never been ill before. And his birth history and family history had no bearing on his present trouble.

On the night of July 18, 1922, the baby, who had always been of a happy disposition, was irritable and restless. In the morning of the next day the child cried continuously and was unable to urinate. At seven o'clock the same morning we saw the boy in the Emergency Room of Lebanon Hospital. The child was perfectly normal except for the presence of marked edema of the glans penis. No meatus could be seen. The bladder was palpably distended. Percussion revealed flatness five fingers breadth above the symphysis pubis.

There is no evidence of phimosis, but a thin constricting ring was present around the corona. This band proved to be a thin green thread which we easily severed. Urination promptly followed, and the edema of the glans rapidly disappeared.

Since the patient was of American parentage, we concluded that the thread had been accidentally twisted around the corona by the child. Cases of this sort have been reported in India where this had been done as a means of revenge.

LEBANON HOSPITAL.

Impotence in the Male

By B. S. TALMEY, M.D.,
New York.

Few people are aware of the existence of female impotence, but they all seem to think that they know everything about this anomaly in the male. Still all that is generally known about male impotence is the inability to effect the procreative union, through failure of erection. The existence of any other kind of impotence is only known to the sufferer himself. All the subdivisions of the anomaly of impotence are veiled in complete darkness. They are entirely unknown to the laity. Even the profession is not well informed about impotence. It is only familiar with the manifestation, consisting in the failure to perform the function of conjugality, because it is on account of this failure mainly that the patient seeks medical advice.

This advice is not seldom given in a perfunctory manner. The condition is made light of and is dismissed with a suggestive mocking smile. Still the subject of impotence in all its manifestations is not to be laughed at and ridiculed. It is not only of great importance to the individual sufferer, but also of moment to the health of the family, hence of vast social significance.

General impotence in male and in female may be divided into four main divisions as follows:

1. Impotentia voluptatis, or true frigidity. There is lack of desire for the association or union with an individual of the opposite sex.
2. Impotentia libidinis, or the impossibility of experiencing copulative satisfaction. The positive copulative pleasure tone is absent.
3. Impotentia generandi, or the inability of impregnation and fertilization. The couple remain sterile.
4. Impotentia coeundi, or the inability to effect the procreative union through the impossibility of the phallic intromission in the yonic recipient canal.

The first three anomalies in the male are little known among the laity and are, as a rule, entirely ignored by the profession. Even the fourth impotency, the most frequent in the male, receives only scant consideration in the hands of the busy practitioner. Still each of the four impotencies may cause the wreckage of the family. The anomaly of impotence, especially in the male, deserves therefore to be better known not only to the profession of medicine but also to that of law. Impotence is not seldom the cause for the demand of the annulment of marriage and is often—although not expressly so stated—the remote cause of many a divorce case.

IMPOTENCE OF VOLUPTY.

The attraction between the sexes is transcendental, innate, instinctive. Every normal male is attracted by the female, and every normal female is attracted by the male. The cause of sexual attraction has not yet been found, just as the attraction of the positive pole of the magnetic needle to the negative pole has not yet been explained. Sex attraction is a part of life and is inexplicable as life itself.

The attraction is not of equal intensity in all persons. In some persons the attraction is expressed in gross, in others in ethereal manifestations. Some are dominant by intense emotions of which they can not free themselves except by the carnal element in the association of the sexes. They look for satisfaction in free and unbridled lust. Others find the most delicious sensations in ethereal love, entirely removed from the physical sphere of erotism. But when the desire for concrete sexual expression has sunk to the zero point, then the individual is said to be suffering from impotence of volupty.

Impotence of volupty, or lack of desire, is physiological in childhood. There is some attraction among the sexes even in early childhood, but this subconscious attraction has nothing in common with the desire for erotic union. The girl is, as a rule, more attached to the father, and the boy to the mother. But the conscious adult erotic desire for physical union with the beloved person is entirely absent in early childhood as well as in very old age.

Volupty, or desire, is also absent in castrates, if the operation has been performed before puberty. Impotence of volupty is always present in the anomaly of anorchism, or congenital castrates. Psychopaths, such as low idiots or cretins, have no desire for the association of the opposite sex. Impotence of volupty for the opposite sex is natural in the anomaly of homosexuality. Sometimes there is no anatomical or psychological cause to explain the presence of congenital impotence of volupty. The anomaly may then be compared with that of color blindness. The libidinous substances, supposed to circulate in the blood of the normal individual, are probably absent in these patients. Such a case came recently to the notice of the writer, when invited to examine a patient in an action for annulment of marriage on account of impotence coeundi.

Case I.—Mr. S., thirty-seven years of age, six months married, was living separated from his wife for the last three months and was sued by her for annulment of their marriage on account of his impotence. He was always nervous as a boy. At puberty he began to practise tactile masturbation, but never to excess. His erections have always been feeble. He never had any strong morning erections. Women had little attraction for him nor did men. For this reason he never had nor did he ever try to have carnal relations till his marriage. He had a faint notion that he would not succeed if he tried, and having no desires, he remained virtuous during his long bachelorhood. In the marriage night, suspecting failure, he was shy to approach his bride. When, upon invitation by her, he did approach her he found himself impotent to effect union. He tried repeatedly for three months but never succeeded. thereupon his wife left him and sued for annulment of their marriage. The physical examination shows the left lobe of the prostatic gland to be enlarged and quite sensitive to touch. Both testicles were small and atrophic. The diagnosis was impotentia voluptatis and paralytic impotence of copulation.

Impotence of volupty is sometimes met with in extreme cases of neurasthenia through the exhaustion of the nervous elements in the brain. The lack of force in neurasthenia has a certain effect upon the germ cells, which are composed mainly of force, very little of matter. The spermatozoon, as well as the ovum, contains a vast amount of force, compressed and stored away within its atoms, to build up an animal. When this force is exhausted, the individual suffers from lack of desire. For this same reason, impotence of volupty is not seldom associated with impotence of copulation. Many a patient who complains of premature ejaculation remarks in a casual way that he has noticed his waning desire for conjugality. But, as a rule, these two impotences do not necessarily go together, as in the following case.

Case II.—Mrs. N., a lady of forty, pretty and healthy, in the course of conversation, asked me whether it was right of her husband that he approached her only once in the last two years, and this only upon demand. He is otherwise quite potent, but he asserts that the whole thing is loathsome to him now. She had no complaints in the first fifteen years of their married life. The trouble began after a nervous attack, due to financial reverses. Before the anomaly was explained to her, she suspected him of infidelity. Such suspicion might have led her to the divorce court.

Such a case shows how important it is to know of the existence of such an anomaly from the sociological point of view.

IMPOTENCE OF LIBIDO.

Of no less importance is the impotence of libido or the lack of satisfaction in conjugality. The intensity of the libido is not alike in both sexes and even in individuals of the same sex. It differs even in the same individual according to his moods. Some people speak of an inexpressible bliss. In some persons the intensity of the experience is so overwhelming that it leads to a complete syncope. For others the orgasm means very little, merely a delightful sensation which any other impression, visual or tactual, might awake. When the feeling tone is decreased to zero, when there is no trace of joy whatsoever, then the individual is suffering from impotence of libido.

In pronounced cases of impotence of libido conjugality not only does not evoke the summa libido, but the patient does not derive the least satisfaction from the erotic union. In some patients, especially in women, there is some fore pleasure, but the orgastic explosion fails to materialize. The acme of libido is never reached. Where satisfaction is entirely missing, where there is complete absence of erotic ecstasy at the moment of emission, this very emission becomes an offensive pollution. If Zola calls sterile love an unnecessary defilement—"*Si l'enfant n'est pas au bout, l'amour n'est qu'une salté inutile*"—then joyless conjugation is surely disgusting and is avoided, in spite of the silent reproach or audible complaint of the other party, as in the following case.

Case III.—Mr. F., professor of mathematics, was always normal in his marital relations. For the last few years he had been working on a textbook, and when the manuscript was finished he was not able to find a publisher. The strenuous brain work and the subsequent disappointment made him extremely nervous, and he noticed that ejaculation was taking place without any trace of libido. It evoked no more pleasure than micturition. The result was that he abstained entirely from marital relations. This evoked the resentment and complaint of his wife, and she threatened to leave him.

Such cases not seldom lead to a break in the harmony of the family life, although with tact and good will the extreme unpleasantness may be avoided, as in the following case.

Case IV.—Mr. A., fifty-eight years of age, father of five married children, and grandfather of more than a dozen grandchildren, complained that for the last three years he did not experience the least trace of libido in union. His power of intromission was as perfect as ever before but the libido was missing. Partly to please his wife and partly to test his potency of conjugation he kept up regular marital relations but without any profit for himself. He was a very busy man, treasurer of a vast corporation which made great demands upon his brain force. Since his wife was long after her climacterium and not in great need of conjugality, and he himself was suffering from angina pectoris, he was advised to be extremely moderate in his marital relations and give up the frequent tests.

IMPOTENTIA GENERANDI.

Of vast social importance is the impotence of propagation, or the inability to impregnate the female. Every female, if she is not a degenerate, wishes to have at least one child. If she remains sterile for some length of time she begins to consult one physician after another and submits to all kinds of maltreatment until she meets a medical man who has the good sense and honesty to have the husband examined first. Then it is found that the sterility is due to the husband's anomaly.

Impotence of propagation is found in a good many anomalies, such as anorchismus, cryptorchismus, atrophy or tumors of the testicles, hydrocele compression, epispadia, hypospadia. It is sometimes found in the inflammation of the seminal vesicles. But the main cause of male sterility is due to a previous gonorrheal epididymitis which has rendered the vasa deferentia impervious for the spermatozoa. (According to the enthusiastic recommendations of the Steinach operation such patients ought to bloom in perpetual youth. The entire theory of the internal secretion of the pubertal gland, i. e., the interstitial tissue of the gonad, does not yet stand on solid ground. There is still a great question whether it is the interstitium of testicle and ovary which is exerting the beneficial effect upon the organism or whether it may not be the parenchyma which does it. The fact that the anemic girl may turn into a blooming, healthy young bride through the absorption of the sperma, according to Waldstein Ekler, would tend to show that it is the parenchymatous elements of the testicle which has the tonic effect upon the woman.) The sexual life of the couple moves normally in the approved channels till one day the wife learns the truth, and then the trouble begins as in the following case.

Case V.—Mrs. X. consulted me about her sterility. Her mental suffering was especially emphasized because her husband desired children and blamed her for their sterile marriage. Since her genital organs were normal, an examination of the husband's sperma was made, and it was found devoid of spermatozoa. She was then told that there was nothing the matter with her, that she has been curetted half a dozen times to no purpose, and that the fault was with the husband. Then came the surprise to me. She requested me not to tell her husband about his anomaly. When it was explained to her, that if the husband knew that it was his fault he would stop blaming her for their sterility, she replied that she wanted a child and would have one anyhow. Her husband had no right to marry if he could not become a father. She was not going to remain childless on account of him.

Such a case where the wife is bound to have a child if she had to break the rules, conventions, and formalities of society may easily lead to the courts. But although in the majority of cases it does not lead to infidelity, it certainly leaves a sting in the woman's heart which will cause disturbance in the family.

IMPOTENTIA COEUNDI.

The fourth kind of impotence is the impotency of copulation. It is the impotency *par excellence.* When the laymen and most of the medical men speak of impotence they mean this impotence of copulation and nothing else. Every man knows something about this impotence, still not even the profession is entirely informed about the subdivisions of this anomaly. Because the paralytic form of impotence is incurable the notion prevails even among the professional men that impotence of copulation is incurable. The patient is dismissed with a joke and jibe which are entirely out of place, since this impotence causes a good deal of mental suffering and is not seldom the real cause of many an unexplained suicide.

Impotence of copulation may be divided into five subdivisions as follows:

I. *Organic impotence* of copulation is found in deformities of the penis, in the atrophy, tumors and indurations of the testicles, and in elephantiasis of the genital organs.

II. *Symptomatic impotence* of copulation is met with in certain diseases, such as diabetes, tabes dorsalis, nephritis, or obesity. The first three diseases are of such a serious nature that the patient is more concerned about his general health than about the symptom. The symptom would disappear anyhow if the original disease could be cured. In obesity the patient is looking for advice about his impotence rather than about the obesity.

III. *Psychic impotence* of copulation is the anomaly met with in the higher strata of society, among the cultured classes, among men with vocations requiring great mental strain, brain workers, captains of industry, high officials, and busy professional men. Among these people psychic impotence is even more frequent than atonic impotence is among the general male population. In psychic impotence it is the cerebral inhibition centre which is in a state of exaggerated excitation. In the normal man, at an adequate erotic stimulus, an impulse is sent from the cerebrum to the centre of erection. In psychic impotence the impulse is inhibited from being sent. Psychic impotence is hence due to a certain state of the mind. The differential diagnosis between psychic impotence and all the other forms of impotence is the phenomenon that in psychic impotence the anomaly disappears when the psyche is out of commission, as in sleep. In psychic impotence the erections are quite vigorous during the state of sleeping. The patient awakens towards morning with strong erections. But as soon as the psyche begins to function, the erection ceases, while in the normal the erection remains in the priapic position for a certain length of time. These strong morning erections are not seldom utilized to effect a cure, if the wife is willing to participate in the medical management of the case as follows.

Case VI.—Mr. N., thirty-five years of age, was always normal in his marital relations. During the war he had under his supervision great undertakings which tasked his nerves to the highest degree. After the nervous excitement was over he found his erections to be very feeble when he tried to approach his wife. His morning erections are as strong as ever. His wife was advised to watch him in his sleep and if she noticed a strong erection she should suddenly awake him and cause him to effect conjugality. This she did and succeeded. One such success cured the patient.

But in the majority of cases the wife is unwilling to help the patient. When he approaches her at the unusual time, she repels him with the remark: "Leave me alone, I am sleepy." The result of such a repulsion is an increase of the psychic trauma. The patient retires to his dream life and is permanently damaged. Even the woman of the lupanar is of little use in such cases. Resorting to the lupanar requires preparation, or is in itself a preparation, and such patients have to try conjugation on the spur of the moment, suddenly without any preparation at the unusual morning hours.

Psychic impotence is sometimes only transitory when the patient is in a state of agitation. The more agitated the patient is the more the penis shrinks at the critical moment. It does not expand and feels cartilaginous. The anomaly disappears, as a rule, with the disappearance of the agitation.

But not seldom one such failure during an accidental agitation may cause a psychic trauma through the subconscious effects of cryptogammic nerve currents. The emotional trauma is conserved as an isolated neurogram and may become the substratum of future anxiety attacks, at every critical moment, the emotional ideas having constituted a permanent complex. In this way an occasional failure may become a permanent psychic impotence through the underlying mental fault and autosuggestion.

Relative psychic impotence is sometimes met in men who by shock or by an unusual stimulus have received a psychic trauma in their early youth as in the following case.

Case VII.—Mr. X., thirty years of age, was as a young boy regularly taken to the Tyrolean mountains to spend there his vacation during the summer. When he was fifteen years old he lived with his parents near an Alpine dairy where he roamed around among the cows and became quite attached to the twenty year old pretty dairy maid, who, on her side, took an erotic fancy to the handsome boy. One day while he was lying on the grass near the grazing cows she joined him and taught him the *ars amandi* on herself as the model. This practice she repeated every day as long as the vacation lasted.

When Mr. X. married he found that conjunction was only possible if his wife was attired in Tyrolean peasant costume and had assumed the same posture as his pretty dairy maid years ago had taken when she first taught him the arts of Venus. In the beginning of their married life, in her first ardor of love, the wife granted his requests. The erections were then perfectly normal, and two children were born. Lately the wife rebelled against the silly masquerade, and Mr. X. found himself completely impotent. In the lupanar where, for a remuneration, everything can be obtained, he has violent erections with the puella, dressed as an Alpine dairy maid.

Temporary psychic impotence is not seldom met with when the man is in a state of anxiety, of overexcitement, or of fear of infection, of fear of impregnation, or of discovery. In newlyweds failure may be caused through the overvaluation of physical virginity.

Temporary psychic impotence is found mostly in the highly organized type of society, among superior men, when there is want of responsiveness by the mate. Only the low and the vulgar can use force and associate with an unwilling mate, the superior men are by nature passivists. In the preliminary sex play in such cases the female has to take the initiative in the necessary petting, toying, fondling, caressing, hugging and kissing. Sanctimonious frigidity will not call out his virility. If in squeamish sanctimony she assumes the attitude of "serve yourself" and refuses to perform her share in the preliminary rites, her behavior will induce dissociation and will not call out the virile priapic attitude. The "serve yourself" posture, where the supine position and the femoral divergence are the only contributions, wrung from the hypocrisy of the mate, may suffice for the common dull people to whom the overtones of sex are unknown and with whom the mere presence of the female makes an instant appeal to their virility. These individuals mate on a simple physical basis like the animal; and organic attraction is millions of years old, trained to respond to the slightest stimulation. But the intellectuals mate more or less on the basis of intellectual attraction; and intellect is still young, scarcely a few thousand years old, the instinctive paths are not yet well leveled, smoothed, and planed. Icy frigidity which repels even the common man, therefore, makes the superman's sex relations entirely impossible. The more cultured and sensitive the man is, the greater will be the disturbance in the consensualism between stimulation and erection. If the female throws obstacles in his way, his volupty, potency, and pleasure tone of the libido will be greatly modified.

The aristocrats of love such as philosophers, poets, artists, singers, preachers, architects, captains of industry, or people of superior intelligence, are impotent in the presence of frigidity. The superior man, as a rule, suffers from a certain kind of idiogamy. He can only consort by the aid of alluring caresses of his mate. It is true, in a certain respect, that the woman's virginal reserve attracts men, but she must not continue this reserve throughout her entire married life or repel by coldness. If the man be of a recoiling nature, the least frown or mood of indifference will frighten him and evoke a certain subconscious resentment, and he turns inward to himself. Even if he succeeds in the phallic intromission into the recipient canal, the positive pleasure tone of the libido will be greatly affected. The intensity of the affect may be decreased to zero. Only the ecstatic consummation of mutual rapture and reciprocal joy can satisfy him. *"Odi concubitus qui non utrique resolvunt."*

Such men may resort to extramarital miscegenation, to the transient unions of the lupanar where the oversexed[1] dispensers of pleasure barter their sex for a consideration, and craving libidinous experience for themselves, have trained themselves to receive and bestow somatic satisfaction on the most timid and diffident. They know how to encourage, urge, and stimulate even the highly organized men who cannot serve themselves. The result is that such men are relatively impotent in their marital chamber and perfectly normal in their transient unions. On the other hand, there are men who are impotent just in company of the venal woman through the anaphrodisiac of fear of infection.

Extreme excitement after long abstinence may cause temporary impotence. The expectancy and joy over the final reaching of the goal causes a great nervous disturbance within the inhibitory centre which becomes overexcited, and at the critical moment the erections fail, the penis becomes flaccid, and shrivels half its normal size, as in the following case.

CASE VIII.—Mr. N., fifty years of age, father of two grown up children, perfectly normal in his marital relations, becomes infatuated with a young lady of his acquaintance. It took him several weeks' pleading before she consented to intimacy. At last he received her consent to call on her. But at the critical moment he found himself completely impotent and instead of the expected bliss he reaped ridicule and contempt.

Romantic men with their overvaluation of the female character may find themselves temporary impotent from sheer nervousness through the obsession of shame, associated with modesty and timidity. In the subconsciousness of the romantic man there is still lingering a certain awe and reverence towards the door of life, transmitted from the remote period of yonic worship. This door has still a symbolic, anagogic significance for him. This part of the female anatomy is still taboo, it must not be seen, touched, or even thought of by an outsider. So every boy is taught in home and school, and it remains a complex in his subconsciousness throughout his whole life. He is afraid of woman in a generic sense. This awe may act as an inhibition against the required impulse which ought to start from the brain centre to the centre of erection, when the newlywed approaches his young bride.

This same man would find little difficulty in the association of the woman of easy virtue. The latter is considered a public comfort station, a privy, where he discharges the contents of the seminal vesicles, just as he discharges the contents of the bladder, without giving any thought to the receiving channels of the discharges. Most men do not care much for the looks of the privy, any place is good enough for them. Some men are more fastidious and rather pay a considerable price for a beautiful, ornamented, and scented environment. The beautiful object may have even a certain charm for them for a while, and then it is dismissed out of the mind and forgotten. Thus with the woman for whom he has none of the higher feelings he is perfectly potent.

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[1] Of fifteen thousand girls Wells Elliott spoke to and offered to take them out of the houses of ill fame, only fifty accepted and of this number practically all went back into the same life. They are all oversexed. (*The Cause of the Social Evil*, p. 80.)

But the entire aspect changes when the romantic man approaches his wedded wife, the object of his sentimental love. Then the phylogenetic and ontogenetic taboo towards the entrance to the temple of life comes into play, and the psychic inhibition paralyzes the centre of erection. The violent priapic membrum wilts at the critical moment.

The same effect as excessive reverence may have on one man, exaggerated disgust may have on another. Some men cannot forget the complaint of a certain father of the church: *"Inter faeces et urinas naseimur."* They are suffering from a certain cloaca complex. The propinquity of the bladder and rectum outlets serves as a deterrent to their ardor. The centre of inhibition comes into full play and prevents a full erection. In other men, the pale rose color of the vestibule, especially in the child which they might have had occasion to observe, when children themselves, has a deleterious effect upon their virility. The lining of the vestibule resembles a mucous membrane in general appearance, and a mucous membrane reminds one of a wound, of blood and has an unesthetic effect upon the artistic. An open mouth, exposing the mucous membrane, is not an object of beauty. It might be for this very reason that the sculptor of the Laocoon group lets sigh only, while Virgil (Aeneid II, 222) lets him with open mouth roar like a wounded sacrificial steer escaping from the altar.

> *"Clamores simul horrendos ad sidera tollit*
> *qualis mugitus, fugit cum saucius aram*
> *taurus et incertam excussit service securim."*

Neither the mucous membrane of the mouth nor the vestibular lining are objects of beauty from the artistic point of view.

The vestibule, on account of its flesh color and of the catamenia, is actually called the wound in some parts of Europe. Such conception of a wound may have an inhibitory effect upon the brain centre which controls the centre of erection. This fact would explain the war impotence, met with in many soldiers who returned from the battle field. They have seen so many wounds that the sight of a wound disgusts them, and the mere concept of the vestibular wound causes repugnance and loathing and increases inhibition.

IV. *Atonic impotence* of copulation is next to the psychic form the most frequently met type of this anomaly. Here the centres of erection and ejaculation, the peripheral genital nerves, the culliculus or veru montanum, and the prostate are directly affected, i. e., the nervous apparatus of the genitals themselves is diseased, not the psyche or the mind. Atonic impotence is, as a rule, due to excesses in venery of any kind, masturbation, coitus interruptus, mental erethism, and tactile erotism, and last but not least in excessive copulative indulgence. In the latter and in masturbation, each exercise ending in a seminal discharge, the centre of ejaculation is surcharged by too frequent demands and impressions and is hence in a state of continual irritation. The veru is enlarged and in a state of chronic inflammation. The result is an incomplete erection and a premature emission. Ejaculation does not come in jets as in the normal, the sperma oozes out in drops from the meatus of the organ in a flaccid state.

Onanism, or withdrawal, or coitus interruptus, often leads to atonic impotence, in the first place on account of excessive indulgence. In onanism the individual rarely reaches the intensity of the normal orgasm, or the normal end pleasure. Onanism leaves the couple in a state of dissatisfaction and avid for repeated conjugality which leads to the weakening of the genital nerves of both mates. But the main cause of the deleterious effect upon the male genital centres in coitus interruptus is the constant anxiety of missing the right moment for the retreat.

In tactile erotism, or excessive dalliance, going on for months or years, the centre of erection becomes exhausted and the consensualism between stimulation and erection is interrupted. Even the strongest stimulus, emanating from the exposed yoni in the coitional posture does not any longer evoke the priapic state. In tactile erotism, flirting and philandering are not the means for a certain end, viz., conjugality, but are taken as ends in themselves and hence become perversions in the psychic sphere. A great passionate conation has been frustrated, a great flood of volupty stops short of the copulative orgasm and is checked in its normal course in ending in connubial relations. If such sensuous practices are often repeated, the sex centres are materially weakened, while the veru is in a state of permanent hyperemia.

A similar weakened condition ensues from excessive mental erotism, or day dreaming, where the mind calls up images and lewd situations whereby erection and orgasm are produced without any tactile assistance.

All the venereal excesses cause a weakness of the nervous centres in the spinal cord and a break of consensualism to adequate stimulation. The nervous apparatus does not respond at all to the strongest stimuli or responds only weakly at the critical moment. The nerves are not equal to their task, and copulative impotence or premature ejaculations are the result.

The number of men suffering from atonic impotence is legion. It is more common than generally supposed. The anomaly is mostly found in middle aged men when the wife has passed the climacterium and is generally no more anxious to be importuned with practices which usually have little charm for her, as in the following case.

Case IX.—Mr. L., an artist of great merit, married a woman several years older than he was. His marital life was quite normal until recently. At present he is fifty-one years of age. In the last two years he noticed that his sexual powers were waning, that the erections are becoming weaker, and that the ejaculations were more or less premature. They took place either before entrance had been effected or immediately after entrance. The physical examination showed a rather small prostatic gland. This patient was cured after two months' treatment.

How excessive dalliance may undermine the sexual powers even of the strongest man is shown in the following case.

Case X.—Mr. H., a professor in one of our great universities in the east, thirty-five years of age, when he first consulted me was suffering from premature ejaculation and weak erections, due to extensive and long dalliance with the fair sex. He was tall, handsome and a picture of health, hence much sought by the fair young ladies of the small university town. After three months' treatment he was cured, entered the army and went to France. Three years later he returned to me with the remark: "Here I am again, there was again too much dalliance."

The most pathetic cases are those due to abstinence in marriage, associated with excessive tactile erotism, as in the following case.

Case XI.—Rev. H., a missionary in the capital of one of the enemy countries, forty-five years of age, out of religious scruples had never had any relations with the opposite sex. In his boyhood he masturbated moderately for a few years and then stopped the practice altogether. He married in 1916, but living in an enemy country during the war, he could not afford to have any children, and the only prevention compatible with the couple's religious convictions was total abstinence from conjunctio membrorum. But they were unaware that abstinence means also refraining from tactile erotism. They did not abstain from petting, toying, hugging, and kissing, or from all the sex preliminaries. They only stopped short of intromission. In 1921 the couple wished to have children, but the husband found himself completely impotent. The consensualism between the strong stimulation of the nuptial bed and the erection had been broken through the tactile practices for five long years.

Atonic impotence is not always caused by excesses in venery. Sometimes it constitutes one of the symptoms of neurasthenia or is the result of a protracted disease. When all the other nervous elements of the organism are in a low state of vitality, it is quite natural that the genital nerves are also in a weakened condition. In such cases, prolonged and protracted preliminaries, not seldom demanded by the female to have her passion properly aroused and her volupty prepared for the orgastic end libido, are often prejudicial and detrimental to the man's potency, as in the following case.

Case XII.—Mr. S., thirty-five years of age, strong and healthy, has led a normal venereal life, according to the tenets of his group. In the first years of his married life he was perfectly normal. After the first child was born, he practised coitus condomatus for several years, and this practice somehow weakened his sexual powers. For the last three years he found his ejaculations becoming more or less premature. At present emission takes place immediately upon entrance and sometimes even before. In the beginning the erections are quite strong, and if he could effect conjugation immediately at the outset of the erection, he claims that the act would move in normal channels. But his wife objects to such procedure and demands a long protracted dalliance and caressing as a preparation for her orgastic summa libido. The result is that by the time she is ready his centre of ejaculation is excited to the breaking point and emission takes place immediately upon entrance.

The borderland between psychic and atonic impotence cannot always be delineated with absolute certainty. Each anomaly harbors some elements of the other. The boundaries can not always be distinctly traced. There is always some psychic trauma in atonic impotence, while the genital nerves are somehow affected in psychic impotence, as in the following case.

Case XIII.—Mr. F., twenty-eight years of age, a writer of short stories, masturbated moderately between fifteen and eighteen and then stopped the practice for the association with the fair sex. Until twenty-six years of age he was perfectly normal in his sex life. In his professional life he has often occasion to indulge frequently and excessively in tactile erotism. For the last two years he found that the emissions occur immediately upon entrance. The erections are strong in the beginning but upon entrance, emission takes place after five seconds. The morning erections are as powerful as ever. For the last few years he was working very hard, sometimes writing fifteen hours a day. This hard work made him extremely nervous. The perfect morning erections would tend to show that the premature emission was due to a psychic overexcitation. Still the examination showed a sensitive small prostatic gland. The premature emission was thus partly due to a weakness of the centre of ejaculation and partly to his general nervousness. The patient was thus suffering from a combination of psychic and atonic impotence.

Such combinations are frequently met with, and it is not an easy matter to decide upon a strict exclusive diagnosis. Still the main symptoms in atonic impotence arise upon the basis of organic affections of the genital nervous system, due to exhaustion either from excesses or from general neurasthenia, while the mind plays the most considerable part in the genesis of psychic impotence, due to apprehensions, dwelling in the depths of the psyche, which have a deterrent effect upon the sexual powers.

V. *Paralytic impotence* is the last form of impotence of copulation. Paralytic impotence is mostly found in tabes dorsalis and in paresis, but it is also met with in grave forms of neurasthenia where the nervous elements of the entire organism are affected. The exhaustion of the spinal genital centres are especially pronounced. The genitals are withered, flaccid, the penis is in a state of atrophy, the skin of penis and scrotum is cold, shriveled, and anesthetic. The testicles are atrophied and in a state of shrinkage. The pathognomonic symptom of paralytic impotence is the entire absence of the usual morning erections.

True paralytic impotence is incurable. This incurability gave impotence in general its bad reputation which it does not deserve. For psychic and atonic impotencies are amenable to treatment, if they are not too far advanced. The treatment is generally slow, and patient and physician become often discouraged. But if physician and patient do not lose their patience, treatment is successful.

In paralytic impotence treatment is of no avail. The prognosis is absolutely unfavorable. Still some patients may be given the benefit of the doubt and treatment tried. Distinct outlines, except in tabes and paresis, are not always present. The symptoms are not always sufficiently typical.

The treatment of impotence of copulation is not difficult and does not require the great skill of an expert, except for the diagnosis. Certain tonics, hydrotherapeutics, massage of the prostate, and electricity, and especially the proper diet, or rather the mode of life of the patient and the conduct of his mate, will lead to final recovery.

In psychic impotence, based on a certain complex, a brief explanation may effect a cure. An idea cannot be stored away after it is ideated, or thought out. Living over again an old experience does not allow any more the obsession growing upon the patient's mind. It is the merit of Freud to have called the attention of the scientific world to this truth. Although he surrounds the fact of the ideated idea with a good deal of strange symbols and mystic practices, to which the cold logician can not subscribe, still the fact remains that the ideated idea removes the psychic trauma.

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Food Allergy as a Cause of Irritable Bladder*

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Patients who have frequent painful urination or constant pain over the bladder often have symptoms the severity of which are out of all proportion to the lesions found after careful examination by internists, urologists, neurologists, röntgenologists, or pathologists. Sometimes slight pathology is found and the patients are treated under the diagnosis of cystitis, urethral caruncle, adhesions about the bladder, misplaced uterus, or pelvic inflammatory disease. The treatment of the latter conditions may be successful, but the bladder symptoms may continue as severely as before. Cases of this type are frequently encountered in the practice of medicine, especially in women, and the most diligent and thorough investigation may not disclose evidence which makes a rational diagnosis possible. Therapy may be equally unsuccessful.

Frequent urination, painful urination, and continuous severe pain over the bladder are rather often the result, I believe, of hypersensitiveness to certain foods and I wish in this papr to describe one typical case and discuss the condition briefly. A more complete report will appear in the *Annals of Clinical Medicine.*

CASE REPORT.

A woman, aged twenty-two, was referred to me by Dr. M. T. Dingess, because of bladder trouble. The family history was negative for allergy so far as she knew. The past history was important only for the fact that she had been subject to urticaria at odd times. For two years before coming to me she had been troubled with frequent burning urination which was at times so severe as to confine her to bed. She had been treated under many different plans without relief, in fact she had not been entirely free from bladder pain for a single day during her illness for two years. She was treated by me for ten days with bladder sedatives without relief.

Physical examination showed poor nutrition, slight chronic pelvic inflammatory disease, cervical tear, tenderness over the bladder by abdominal and vaginal examination, tenderness in both kidney regions, and marked evidence of ptosis.

Catheter specimen of urine showed nothing of interest except an occasional pus cell and low specific gravity. Other laboratory examination including Wassermann reaction was negative.

X ray examinations disclosed no stone and nothing of further interest except ptosis.

Cystoscopic examination of the bladder and urethra by Dr. J. E. Burns showed nothing abnormal.

Intracutaneous tests with a number of food proteins showed marked sensitiveness to wheat and slight sensitiveness to several other grains (barley, rice, and oats). The tests were followed after several hours by an unusually severe attack of frequent painful urination which lasted twenty-four hours. She was given adrenalin during this attack with temporary relief.

For treatment she was told to avoid all grains, especially wheat and its derivatives. All other medication was discontinued. Two days after this she was completely free from bladder disturbance for the first time in two years. She has continued well now several months. She has been completely free of bladder disturbance except for three attacks lasting several hours which followed the eating of a small amount of wheat flour taken on two occasions as a clinical test and after the subcutaneous injection of .01 mg. of wheat protein. In each of these instances she had an attack of painful urination resembling cystitis which lasted a number of hours.

DISCUSSION.

I have carefully examined five patients three of whom appeared to be clear examples of individuals who had frequent painful urination as a result of the ingestion of certain foods. Two of the five, I believe, were examples of the same type of illness, but the clinical picture was more complex in that they had abnormalities in the urinary tract, which may have contributed to their illness. In discussing this condition I believe it is better to use only the three uncomplicated cases at our disposal.

In these three cases each patient was subject to attacks of frequent painful urination. In none of the three was anything found by history, physical examination, röntgen examination, or laboratory tests which could account for their symptoms, except hypersensitiveness to foods. In two of the three cases in which cystoscopic examination were made, the bladder mucosa and urethra was normal.

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*Read before the American Therapeutic Society, Washington, D. C., May 2, 1922.

In two of the three cases the patients gave a family history of allergy. All three patients, at some time during their lives, had had other symptoms of allergy, such as angioneurotic edema, hives, or asthma. Each of the three patients gave positive cutaneous reactions upon intracutaneous injection of small amounts of substances extracted from some one or more foods which they were in the habit of eating and in each case characteristic exaggeration of bladder symptoms followed the intracutaneous or subcutaneous injection of small amounts of the extracts to which they gave positive cutaneous tests. The three patients were relieved by the avoidance of foods to which they were sensitive and two had a return of bladder symptoms during a well period after the eating of such foods.

These findings seem to indicate very clearly that bladder pain can be caused by hypersensitiveness to food. The circumstance that bladder pain can be caused by a food, is not altogether new, especially in the lay mind. The impression has been gained, however, that such pain is due to an acid or crystalloid substance in the offending food in spite of the fact that vinegar (an acid) does not produce such a result nor do other foods rich in crystalloids.

It is not unreasonable to suppose that abnormal conditions in the pelvis (as observed in the two cases not discussed previously) might have played contributory rôles in the centring of allergic symptoms to the bladder, and furthermore, that chronic bladder allergy of many years' standing might lead to pathological changes in the bladder mucosa or sphincter, making the condition complex and more difficult to cure. This statement is made not for the purpose of clouding the clinical picture of bladder allergy, but rather for the purpose of pointing out that bladder allergy may exist in a certain number of patients in whom actual pathological conditions are found. The discovery of this should it exist is important in the treatment of symptoms not due entirely to organic disease.

It is almost necessary at this point to discuss briefly the remarkably interesting subject of hypersensitiveness. A rather large proportion of individuals inherit a constitution which makes it possible for them to become sensitive to some foreign substance. When this is the case, they react in characteristic ways whenever they come in intimate contact with the substance to which they are sensitive. Patients sensitive to certain pollens may have hayfever or asthma whenever they inhale air which contains the pollen to which they are sensitive. In patients of this type, the subcutaneous injection of infinitesimal quantities of pollen extract may bring on the symptoms of hayfever or asthma within a few minutes. Similarly in patients whose gastric mucosa is sensitive to some food (such as honey or egg) an attack of abdominal pain may not only follow invariably the ingestion of a small amount of honey or egg, but also usually follow their subcutaneous injection.

The bladder cases differ from the above mentioned respiratory and gastric cases in that the bladder mucous membrane does not under ordinary conditions come directly in contact with a substance to which it may be sensitive, as in the gastric and respiratory cases. Bladder symptoms can occur, therefore, only after the offending substance gains entry to the body through some distant port. Bladder symptoms, therefore, occur usually as part of a general reaction and for this reason are more frequently accompanied by generalized symptoms of allergy, such as hives, than are the respiratory or gastrointestinal cases.

Furthermore, bladder symptoms do not complicate the cases of respiratory diseases, such as hayfever and asthma, when they are caused by air carried substances, such as pollen or horse dandruff, for the simple reason that in pollen cases the infinitesimal amount of pollen in the air is rarely absorbed in sufficient quantity to give rise to generalized attacks. In food cases, however, foreign material is frequently absorbed in quantities sufficient to give rise to generalized attacks. We have inquired for a period of two years concerning the existence of bladder symptoms among aptients who had pollen hayfever or asthma, and found no single instance of definite bladder disturbance starting with the pollen season and ending with frost. We have observed bladder disturbance, however, in several patients while under pollen treatment for hayfever or asthma —also once after diagnostic tests with pollen extract.

In each of the cases which I studied the patients were tested for sensitiveness to all the common meats, common vegetables, to milk, eggs, fruits, fish, nuts, condiments, grains, bacteria, to many varieties of animal hair and feathers, and to all the common spring and fall pollens of this district. Three of the five cases were sensitive particularly to vegetables and two particularly to grains. Only two were markedly sensitive to pollen. Two of the patients gave noteworthy reactions after inoculation with bacterial extracts. In neither instance was this reaction so marked, however, as those produced by the intracutaneous injection of the offending foods.

DIAGNOSIS.

The diagnosis of bladder allergy is not difficult if one suspects the condition. One may suspect it whenever bladder symptoms seem out of all proportion to clinical findings, especially among patients who give a family history of hayfever, asthma, or hives, or who have themselves had such symptoms. The positive diagnosis of a case is largely a matter of discovering the offending food and obtaining relief by avoidance of the same. Intracutaneous tests are especially useful for this and without their use a correct diagnosis might be almost impossible. Unfortunately, bladder reactions are usually delayed reactions and generally do not occur for several hours after the ingestion of an offending food. On this account it is an almost hopeless matter to trace out the source of the disorder by having the patient eat or avoid certain foods. Fortunately, however, cutaneous testing is more simple in cases of this type than in other types of allergy, because of the fact that in the bladder cases the sensitiveness is almost always against a food. For this reason testing with the enormous number of substances which gain entry through the respiratory tract is not so necessary as in the respiratory cases.

We recommend the intracutaneous method in testing patients of this type rather than the cutaneous method. Cutaneous tests, while useful in testing for sensitiveness to air carried allergins, fail in the bladder cases.

TREATMENT.

The treatment of bladder allergy may be carried out along four lines. First, removal of the cause; second, specific protein treatment; third, symptomatic treatment; fourth, removal of contributory factors which might exist, such as polpys, caruncle, or cystitis.

Removal of the cause is simple when a person is sensitive to an unusual article of diet such as tomato, onion, asparagus, or oatmeal. Removal of the cause is difficult when one is sensitive to common articles such as milk, eggs, or wheat which are used so frequently in cooking and in this case the second method of treatment, namely, specific protein treatment may be advisable.

As a symptomatic remedy, adrenalin given in sufficient doses is recommended. Patients vary markedly in their susceptibility to adrenalin so that a hard and fast dose cannot be determined in any individual case. For this reason it is advisable to start with one half c. c. or less of a one to one thousand solution subcutaneously or intramuscularly given slowly. This can be followed at intervals of from five to ten minutes with one fourth c. c. doses until the patient experiences relief or until the symptoms of reaction to adrenalin become more disagreeable than the bladder symptoms. It can be repeated every four to twenty-four hours, dependent upon the time at which symptoms begin to return. Coexisting abnormalities, such as polyps, cystitis, and caruncle should be handled according to methods approved by urologists.

CONCLUSION.

In patients who have frequent painful urination, or constant pain over the bladder, the severity of symptoms is frequently out of all proportion to the lesions found after careful examination by specialists in different lines. In cases of this sort bladder symptoms are frequently the result, I believe, of the ingestion of foods to which the patient is sensitive.

It is well known that a certain percentage of humans may become sensitive to foreign substances of many varieties, and that when this is the case they react in characteristic ways whenever they come in intimate contact with the substance to which they are sensitive. The bladder mucous membrane almost never comes in direct contact with alien material. The local symptoms in bladder cases, therefore, can occur under ordinary conditions only as part of a general reaction after the alien material has entered the body through some distant port.

Bladder symptoms rarely complicate allergy caused by air carried substances, such as pollen and horse hair, probably because in cases of this kind insufficient foreign material is absorbed to give rise to a marked general reaction. It occurs more frequently in the cases where there is opportunity for the absorption of larger amounts of material, such as the food cases. For this reason bladder allergy is more frequently accompanied by other symptoms of allergy, such as angioneurotic edema and hives, than are the pollen cases.

The subjective symptoms resemble those of cystitis and may be either mild or so severe as to confine the patient to bed.

The free use of intracutaneous tests is a very valuable aid in the discovery of these cases.

In uncomplicated cases, complete relief may follow the avoidance of foods to which an individual is sensitive.

WALDHEIM BUILDING.

Hypernephroma of Kidney: Removal with Perirenal Fat en Masse

By A. RAYMOND STEVENS, M.D.,
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CASE.—H. R., male, aged fifty-one years, admitted to Bellevue Hospital in the early morning of March 20, 1922. The chief complaint was bloody urine and inability to void. Prior to present illness the patient had enjoyed good health, had had no serious illness, denied gonorrhea and syphilis, had had no urinary symptoms, and had never passed blood in urine. He had not had pain about either kidney.

The patient voided normally the afternoon of March 19th. At midnight he had a desire to urinate and with difficulty passed a small amount of very bloody urine. The desire to urinate and the inability continued, and the patient was brought to the hospital.

Physical examination showed a short, rather fat adult male, in acute pain on admission. The general examination was quite negative except for tenderness over bladder region. The bladder seemed distended on percussion. It was thought that there was slight tenderness in left costovertebral region. No glandular enlargement present. Members of the house staff were able to catheterize the patient and empty bladder of urine and blood clots. In the afternoon of March 20th patient was again in pain with distended bladder. At this time I cystoscoped him and through the sheath of the instrument got rid of over a pint of urine with clots. Then a good view was obtained and highly colored bloody urine and clots were seen to come from left ureteral orifice, but apparently clear urine from right. The bladder was normal. The left ureter was catheterized easily and bloody urine obtained. The right side admitted catheter only one and a half cm. and no specimen was obtained. Indigocarmine injected intravenously gave a deep blue color from the right ureteral orifice in five minutes. None could be recognized in bloody urine from left side. A pyelogram of the left kidney was taken.

The patient was put back to bed and remained comfortable for some hours, but there was renewed difficulty in urination; and left nephrectomy was done at ten o'clock that night. The obesity of the patient made it a little difficult to carry out the procedure but we were able to strip back the peritoneum and remove the kidney with its perirenal fat *en masse*. The kidney itself was exposed only at one spot, at the lower pole. After removing the specimen the fat was stripped from the kidney disclosing a large involvement of the upper half of the kidney as is clearly shown by the specimen presented. The pelvis and the calyces have been opened to demonstrate their relationship to the tumor and to compare their relative locations with the pyelogram which is shown. There was no involvement of the renal veins and no palpable nodules about the kidney pedicle.

The convalescence has been marred only by fairly marked bronchitis, with indefinite signs of pneumonia. The patient is now up and about, but is still in the ward because of weakness and some shortness of breath.

The pathological report, made by Dr. Symmers and Dr. Ryder, showed that the specimen consisted of a kidney, surrounded by loosely attached perirenal fat in which were several hemorrhages probably operative. The kidney was irregularly enlarged at its upper pole by many large and small nodules, yellowish pink in color and ranging in size up to that of a walnut. On section these nodules were found to consist of rounded areas, not capsulated, but circumscribed of soft orange yellow tissue. The pelvis was somewhat thickened and there were several hemorrhages under mucosa.

The microscopic examination showed that the growth consisted of large polyhedral cells, with clear cytoplasm and rather small slightly hyperchromatic nuclei. These cells were ranged in alveoli for the most part. The alveoli were small with no lumen. In places the stroma was absent; in others were trabeculæ of cellular fibrous tissue. The diagnosis was hypernephrosis.

40 EAST FORTY-FIRST STREET.

Emergencies in Urology*

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It is my aim in this paper to discuss such emergencies in urology as will be of interest to the general practitioner and others who may be called in hurriedly to treat such emergencies. Final results and prognoses depend so much on how and when something is done during an emergency, that I feel this paper deserves attention and thought. Doing the proper thing at the proper time means much for the reputation of the physician and the welfare of the patient.

SUPPRESSION OF URINE.

By suppression of urine is meant the failure of the kidneys to perform their excreting function. It must be distinguished from retention of urine in the lower urinary tract. Such retention may occasion suppression.

Causes.—The causes of suppression are: 1, Nonobstructive; 2, obstructive. Nonobstructive suppression occurs in crippled kidneys secondary to trauma, even trifling trauma, especially that of the genitourinary tract. It may follow severe systemic injury and is an occasional postanesthetic and postoperative complication. It is partly reflex, partly toxic, as in the case of extensive burns of the skin, and may be brought about by the passive congestion incident to extreme cardiac weakness.

Symptoms.—The symptoms of nonobstructive suppression aside from the failure to pass water or to present the evidence of fluid retained in the bladder or renal pelvis are those of uremia. Obstructive suppression is that associated with blocking of the ureters or of the vesical outlet. The symptoms of obstructive anuria may be veiled by an accompanying retention but failure of further excretion on relieving the retention and the later development of uremic symptoms will sufficiently mark the diagnosis.

Treatment.—After operations on the genitourinary organs free diuresis should be secured and for this purpose the free ingestion of water and enteroclysis of half normal salt solution are beneficial. In all cases of failure of the urinary secretion active elimination should be secured by hot packs, vapor baths, in some cases by pilocarpine hypodermically and by free purgation by calomel and the saline cathartics. In the common form of suppression due to reflex sympathetic causes, hot poultices, cupping, and other counterirritants are useful, and it is here that high hot injections of salt solution into the colon are doubly indicated. Hypodermic injections of caffeine sodiobenzoate (in three grain doses) sometimes seem to have a beneficial effect on the kidneys. If shock is the cause, intravenous injections of adrenalin chloride or pituitrin are indicated.

The various operative procedures which have been beneficial for suppression *per se*, aside from those directed to its causes, are passage of the ureteral catheter, with or without pelvic lavage, simple puncture of the kidney, splitting the capsule, incisions into the capsule, decapsulation and nephrotomy. These operations should not be done until other measures have failed, nor should they be postponed until the patient becomes apparently moribund, though even then they have been successful. Operative measures are indicated if three days of conservative treatment have proved futile, though cases cured after eight days are reported. A local cause, such as a blocking calculus, should be suspected and searched for in the absence of an acute toxemia or a preceding history of chronic renal degeneration.

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RETENTION OF URINE.

Retention implies inability to empty the bladder. This may be due to obstruction at the neck of the bladder or in the urethra; to reflex spasmodic action of the sphincter; to atony or paralysis of the detrusor muscles.

Locomotor ataxia, Pott's disease, general palsies, sclerosis, and severe cerebrospinal injuries may, by interference with the vesical centre of the cord, occasion paralytic retention. The muscles may be paralyzed by overdistention, by inflammation extending from the mucous coat or from the peritoneal investment, as in peritonitis or as the result of degeneration consequent upon prolonged exhausting diseases.

Spasmodic retention may follow shock or injury, operations upon the spermatic cord, the rectum or the testicles, or prolonged voluntary retention. Obstruction at the vesical orifice may be due to tumor, impacted stone, clot, foreign body, or prostatic hypertrophy.

From an etiological viewpoint, therefore, retention of urine may be classified as follows: 1, Retention due to traumatism; 2, retention caused by stricture; 3, retention due to blocking of the urethra by stone, foreign body, clots, or portions of new growth; 4, retention due to paresis or incoordination of the bladder muscles; 5, retention caused by prostatic enlargement; 6, retention from congestion or acute inflammation.

Retention may be of sudden or of gradual onset and may be partial or complete. Since we are at present interested only in the emergencies, I will restrict myself to the subject of acute retention.

ACUTE RETENTION.

The symptoms are pains felt in the region of the bladder and steadily increasing in intensity, recurrent unavailing efforts at micturition with a constant torturing desire, extreme tenderness over the region of the bladder, and the formation of a distinct tumor, dull on percussion, globular in shape, and sometimes extending as high as the umbilicus. Rectal and suprapubic palpation show that this tumor is fluctuating and that it occupies the position of the distended bladder. The final proof is afforded by catheterization.

The temperature is normal or subnormal and if fever develops it is nearly always due to concomitant infection and not to retention itself. The general treatment of acute retention calls for relief of tension as soon as possible and the observance of rigorous antiseptic precautions in the use of the catheter.

One of the most important things in acute retention is to secure an accurate history. This will almost without exception lead at once to the cause and the proper carrying out of relief measures.

When retention develops without apparent cause in a person who gives no previous history of urethral or bladder trouble, the neuropathies must be suspected and search should be made for corroborative signs of ataxia. This form of retention is usually relieved by palliative measures, hot water enemas (103° F.) followed by hot sitz baths. If palliative measures fail, catheterization in this form of retention is usually a simple matter. Palliative measures will also usually give the needed relief in retention due to congestion or acute inflammatory processes.

An important point that I wish to bring out where retention is due to sudden blocking of the urethra or vesical neck by blood clots, is to place the patient on the back with pelvis elevated. This position, it will be readily seen, favors gravitation of the clots to the upper portion of the bladder, otherwise you may be greatly hampered by the eye of the catheter being blocked by one of the clots. If this does happen inject an antiseptic solution through catheter by means of syringe.

Retention from prostatic enlargement requires prompt mechanical or surgical intervention. The time spent in palliative measures is wasted. The first instrument to be tried after anesthetizing the urethra with a four per cent. novocaine solution is the elbowed soft catheter, having a large sunken eye, a solid tip and a funnel end. If this fails a woven catheter (coudé) is tried. If this fails the double elbowed or bicoudé catheter is tried. In the event of this failing a soft rubber catheter of small calibre, No. 10 or No. 12 F., is slipped on an iron wire stylet.

The purpose in view is to keep the lip of the instrument opposed to the urethral roof since the roof of the urethra is not usually affected, the floor being where the trouble is encountered. If the last mentioned method fails the long prostatic silver catheter may be used.

Should gentle efforts with all these instruments, continued not more than two or three minutes for each, result in failure, suprapubic aspiration is indicated. If you succeed in entering the bladder through one of the other forms of instrumentation, great care should be used in draining off the urine. This should be done slowly, otherwise you might encounter a severe hemorrhage and resultant shock. Furthermore, the bladder should not be emptied entirely. Always wash out the bladder with an antiseptic solution, preferably boric acid solution.

RETENTION DUE TO STRICTURE.

The diagnosis is generally founded on the history and the exploration of the urethra with acorn bougies. It is always well to try palliative measures first, since spasm and congestion play a great rôle. On the chance of the stricture being of large calibre and retention being caused mainly by muscular spasm, an effort may be made to introduce a steel sound about 15 or 16 F. If this fails fine conical and rat tailed soft catheters should next be tried. These failing, filiform whalebone bougies should be used. The filiform may be tied in place or a Gouley's catheter may at once be passed over the filiform as a guide. When a woven filiform bougie can be used the most useful type of catheter is that of Phillips, which is threaded at the top to screw into the base of the filiform. On failure to pass any instrument external urethrotomy is required.

RETENTION FROM TRAUMATISM.

Traumatic causes are many and it is not necessary to go into detail. The general indications are immediate closure of rupture and drainage of bladder by continuous catheterization or by the perineal drainage tube.

Before I leave the subject of retention and the various instrumentations called for, let me impress upon you the extreme importance of gentleness in manipulations and asepsis. The lack of these has caused an undue amount of mutilation with many poor results and troublesome complications.

PARAPHIMOSIS.

The exciting cause is usually more or less forcible retraction of a tight foreskin, though occasionally inflammatory swelling will cause the foreskin to roll back. This complication is particularly liable to occur in gonorrhea, chancroid, chancre, balanoposthitis and all lesions of the genitalia attended by swelling of the foreskin. The constriction causes rapid swelling and in some cases where the tense; inelastic edge of the orifice exerts a more than usual amount of constriction, circulation is markedly interfered with and ulceration and even sloughing involving both the foreskin and the head of the penis may take place.

Treatment.—Treatment consists in reduction by nonoperative or operative measures. Nonoperative reduction should first be tried, but if this fails or sloughing threatens, reduction must be accomplished by cutting the constrictive band. A half inch cut in the middorsal line supplies adequate section of the constrictive band. The incision may be left to heal by granulation or it may be sutured. Hot compresses are applicable to cases of threatening or actual sloughing.

INJURIES OF THE PENIS.

Contusion.—Treatment of contusions is conducted on general principles—rest, elevation, pressure by narrow gauze bandages, application of evaporating lotions and, for the purpose of hastening absorption, gentle massage.

Extensive swelling and discoloration need not occasion anxiety, unless there has been rupture of the spongy or cavernous bodies or of the urethra, in which case you must be on the lookout for gangrene. Dressings of hot bichloride solutions, one in ten thousand, are applicable.

Wounds of the penis may be the same as other parts, incised, punctured, lacerated, contused or combinations of these. Treatment of the wound is the same as in other parts, except that when the urethra is injured intermittent or continuous catheterization must be done. Inflammatory reaction usually excites erection which interferes with healing and should be prevented by full doses of bromide (three drams) daily, by opium and belladonna suppositories, or by hypodermic injections of morphine.

Fracture and dislocation.—Fractures and dislocations of the penis are both possible and several cases are reported of each. In fracture the prognosis from a functional viewpoint is guarded. Rest in bed, firm bandaging of penis against abdomen, and sedatives internally, comprise the treatment. In dislocation the treatment consists in immediate replacement. Usually a perineal urethrostomy is needed to take care of the urine.

Foreign bodies.—I need only mention here the possibilities of foreign bodies of all sorts being pushed into the urethra which will cause symptoms of an emergency nature. Their removal sometimes is very simple and at other times difficult. All sorts of objects have been removed from urethræ.

I also wish to make mention of many cases reported where metallic rings or bands of various sorts have been used in masturbation and the concomitant swelling of penis has caused this band or ring to get caught in the flesh with resultant edema and swelling. The removal of these rings is often a difficult procedure. They almost always have to be filed off.

ACUTE URETHRAL FEVER.

Acute urethral fever follows trauma and is due to absorption of bacteria or toxins through a hyperemic or abraded mucous surface. Acute urethral fever may take either of the two forms: 1, single paroxysm; 2, recurrent paroxysms.

Single paroxysm.—This is characterized by chill, fever, and sweat. The chill is pronounced, the fever high, the sweat copious. There may be such other symptoms as pain in the head and back, delirium, unconsciousness, dyspnea, nausea, and vomiting. In exceptional cases the chill is unduly severe and prolonged, lasting possibly for several hours; the patient collapses, vomits, purges, ceases to excrete urine, and dies in a few hours or in one or two days from shock or uremia or from virulent septic poisoning.

Recurrent paroxysms.—The form with recurrent paroxysms is characterized by irregular elevations in temperature, preceded by rigors or chills, which are not so well marked as in the first attack and followed by sweats.

Treatment.—The treatment depends on the severity of the attack. The method resorted to is that usually carried out in septicemia, shock, or uremia.

CONTUSIONS AND WOUNDS OF THE TESTICLE.

The symptoms vary in accordance with the extent of injury. They may vary from a feeling of faintness with intense sickening pain to extreme shock and death.

Prognosis.—In injuries to the testicle, prognosis should always be guarded and becomes less favorable in proportion to the severity and the persistence of inflammation.

Treatment.—The mildest forms of contusion should not be neglected, since exceptionally they are followed by chronic inflammation and atrophy. The patient should be placed on the back, with the pelvis elevated and the scrotum supported either by a pillow placed against the perineum, by a triangular bandage, or by a bridge of adhesive plaster stretched from thigh to thigh. A small ice bag is placed against the parts, but if cold increases the pain, hot compresses of lead water may be used. The patient should be kept in bed until all active inflammatory symptoms have subsided, then he may be allowed up, wearing a suspensory bandage, which should be worn for months and the patient cautioned against occupations or exercises which are apt to cause a recurrence of inflammation.

RUPTURE OF THE BLADDER.

Etiology.—Rupture may be due to traumatism or it may be pathological. The causes of rupture of the bladder are predisposing and exciting. Of the predisposing causes that of greatest importance is the condition of distention. Indeed, it is difficult to imagine how the empty bladder can be ruptured unless there are extensive concomitant injuries.

Alcoholism is a predisposing factor, but mainly because it tends to encourage a condition of overdistention of the bladder because it stimulates the kidneys and so obtunds sensibility that the desire to micturate is not noticed, even when the bladder is full. Fixation of the bladder by pelvic cellulitis, degeneration of its walls from chronic cystitis and disturbed innervation, may also be counted as predisposing factors.

The exciting causes are fracture of the pelvis, separation of the pubic symphysis, violence applied directly or indirectly, and muscular strain. Thus, kicks in the stomach, falls upon the ischium, and the straining incident to parturition, defecation, urination, or lifting have caused this injury.

Pathological rupture is usually found in a case where there has been urethral obstruction with resultant cystitis and ulceration. The seat of rupture may be intraperitoneal or extraperitoneal, about eighty-five per cent. being intraperitoneal.

Diagnosis.—The diagnosis is founded upon the history of the case, the results of direct examination, and the following symptoms: Shock, tenesmus, urgent desire to urinate which the patient cannot satisfy, or frequent urination and passage of blood.

The simplest method of exploration consists in the passage of a thoroughly sterilized silver catheter through the urethra. If this draws off blood, urine, and clots, the probability of rupture is strong. The irrigating cystoscope is a better means of determining the presence of rupture. The bladder is injected with a known volume of fluid. If there results rapid increase in pelvic tumor and dullness, as detected by suprapelvic examination, this must be due either to the distended bladder or to extravasated fluid. In the latter event failure to recover by catheterization all the fluid injected will show the presence of an extraperitoneal rupture. If no suprapelvic dullness develops, but all the fluid is not recovered, there must be either an intraperitoneal or a subperitoneal posteroinferior rupture. In case of doubt there should be no hesitation in performing either a suprapubic or a perineal cystotomy.

Prognosis.—Rupture of the bladder results fatally in a large proportion of cases and the prognosis is particularly grave when the rent is complicated by fracture of the pelvis and when it is intraperitoneal, death resulting in the great majority of these cases in the first five days. The usual causes of death are peritonitis, shock, and hemorrhage.

Treatment.—In general, rupture of bladder calls for immediate laparotomy, siphoning of the extravasated blood and urine from the peritoneal cavity and the closure of the bladder wound. The aftertreatment consists of continuous or intermittent catheterization.

INJURIES OF KIDNEYS AND URETERS.

One should always be on the lookout for contusions or other injuries to kidneys whenever there is a history of direct violence or crushing pressure applied to the lumbar region. Hematuria, diminished quantity of urine passed, and the formation of a mass in the loin should be watched for. The treatment is expectant or operative, depending on the extent of local and constitutional symptoms.

Injuries to the ureter usually occur during some abdominal operative procedures, especially during operations on the uterus or adnexa. We will let the surgeon worry about this emergency.

1624 Spruce Street.

The Choice of Anesthetic in Major Urological Surgery[*]

By W. HERSEY THOMAS, M.D.,
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Probably no operator is confronted with greater difficulties from the viewpoint of anesthesia than the urological surgeon. Some few years before the advent of the millennium, most of his patients may be referred while they still have good hearts and kidneys, but at present a large number are in the terminal stages of urosepsis and had best be regarded as potential angels. Unless handled carefully they will soar or plunge to that plane of the hereafter which has been determined by the acts of their earthly careers. In many of the senile prostatic hypertrophies and old urethral strictures with the repeated occurrence of retention, serious inroads have been made on the renal function. In genitourinary tuberculosis there are incipient, active, or healed pulmonary lesions which are ready to flare up on slight provocation.

We recognize that operative procedures can never be routine in character but must be adapted to the individual. We would do well to take the same lesson to heart in our choice of an anesthetic. If Hades be well organized there will certainly be a corner reserved for those operators who always use ether in these cases because it is justly reputed to be "the safest general anesthetic in the hands of the average anesthetist." While nitrous oxideoxygen has been administered thirty-five thousand times without a fatality, this large number of anesthetizations included but a small minority of the type of patient under discussion. Many such individuals have succumbed while their tissues were infiltrated with weak novocaine solutions and still others have left us while the subject of a do nothing policy which has been variously described as watchful waiting, masterful inactivity, or criminal neglect. We must admit at the outset that all anesthetics have their dangers in the types under consideration and that a patient may die even when he has been thoroughly studied, conscientiously prepared, skillfully anesthetized, and deftly operated upon. An anesthetic agent which is relatively safe in one instance may be homicidal in another and a drug or method which has a higher mortality or morbidity in the average individual may be the best in a particular case. To select an anesthetic properly one must have a working knowledge of all those in general use. This paper has been written to bring before the members of this society a method which has given myself and others excellent service in major urological surgery in patients with damaged viscera. I refer to spinal anesthesia with stovaine.

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[*] Read before the Philadelphia Urological Society, April 28, 1922.

To those who have given scant attention to stovaine spinal anesthesia in recent years, we would particularly emphasize that this procedure has been vastly improved since Jonnesco's ill advised attempt to make it the anesthetic of choice in general surgery. In the first place, Jonnesco (1) used ten centigrams of stovaine in his lumbar injection; we now use from four to six and never exceed the latter amount. His high injection which contained three centigrams and was more rapidly diffused on account of its dilution has been abandoned. Jonnesco paid little or no attention to the specific gravity of his solution, this depending solely upon the amount of contained stovaine. Most important of all and following the suggestion of Edwards (2) and others, we anticipate the expected fall of blood pressure by administering an ampoule of pituitrin hypodermically immediately after the injection of the stovaine. The same result may be attained by the use of adrenalin intravenously, but neither of these substances is ever mixed with the stovaine or injected into the subarachnoid space.

The technic is as follows: The back is prepared as for any operative procedure. The patient sits on the operating table with his legs hanging down. His back is arched by an attendant who holds his head under her left arm while his abdomen is gently pressed upon by her right fist. Care is taken to avoid lateral deviation of the spine. The needle is of iridoplatinum with a short bevel. The syringe is a two c. c. Luer with a plunger that is accurately fitting and yet capable of being forced out by the intraspinal pressure. Both needle and syringe are boiled in distilled water and brought to the operator in the vessel in which they have been boiled and while the water is still boiling. This insures their sterility and the requisite warming of the anesthetic solution; it also obviates any deterioration of the stovaine from the presence of alkali. The injection is usually made in the fourth lumbar interspace not more than two mm. from the median line. Spinal fluid must escape from the needle if a satisfactory anesthesia is to be obtained. An amount is allowed to flow that is at least equal to the amount to be injected. The syringe containing the predetermined dose of from four to six centigrams of stovaine is then connected with the needle and allowed to fill up with spinal fluid. This is slowly and gently injected and the syringe refilled by aspiration. This procedure is repeated several times and insures a thorough diffusion of the anesthetic. The solution used is that recommended by Babcock (3) and put up by Morgan in sterile ampoules made from alkali free glass. In each two c. c. of the solution there are 0.08 gm. of stovaine, 0.04 gm. of lactic acid. 0.2 c. c. of absolute alcohol, and 1.8 c. c. of distilled water.

Some ampoules contain but 1.5 c. c. of solution and then the various ingredients are correspondingly diminished so that the specific gravity of the solution is always .992. The specific gravity of the spinal fluid is about 1.006 and this figure does not seem to be affected by the age of the patient or the state of his health. The stovaine diffuses upward at the rate of ten centimetres a minute. Despite our deliberate refilling of the syringe and slow rate of injection we usually have the patient's head lower than his feet within twenty seconds from the time the stovaine enters the spinal canal. Not only must the patient's head be lowered but the entire spinal canal must be correspondingly tilted (slight Trendelenburg). This is an important point since it would seem from the work of Smith and Porter (4) "that the fall in blood pressure during spinal anesthesia is due neither to toxicity of drug nor to paralysis of the vasomotor centre but to paralysis of the vasomotor fibres regulating the tone of the bloodvessels in the splanchnic area. The most important of these fibres are given off from the spinal cord from the second to the seventh dorsal segment; some of lesser importance are given off as far down as the first lumbar." The pituitrin is immediately given subcutaneously and the patient usually is ready for operation by the time he is draped and the field again prepared. The psychic side of the administration is exceedingly important and a well trained staff with the confidence of experience is invaluable. No interrogations as to pain are made. A wisp of cotton is pushed beneath the towel bandaging the patient's eyes and made to act as a telltale for the actual ingress and egress of air through the nostrils. The ears are plugged with cotton. Blood pressure readings are taken from time to time and the patient's hands are held above his head by a trained assistant.

The deaths vary from one in fifty to one in seventeen thousand depending entirely upon what statistics you chance to read. This can be explained by the method of selection of the anesthetic. If only desperate and moribund cases are given spinal stovaine, the statistics of the remaining anesthetics are improved at the expense of the spinal. In the last eight years there has been no death from spinal anesthesia at the Samaritan Hospital. This is largely due to the improvement in the technic and to the fact that moribund cases are not so anesthetized.

A corresponding condition of affairs may be found in many tables which give a higher mortality in cases where a fecal fistula has been established than where a resection of the gut has been performed. We know that this does not represent the actual state of affairs since fecal fistulas are frequently made in patients in such desperate condition that resection is out of the question. In the same manner a gentleman who reserves spinal anesthesia for his moribund cases will secure an apparently prohibitive death rate. The surgeon who selects his cases and studies his anesthetics, however, will obtain entirely different results.

Spinal anesthesia is not for the routinist, the careless, nor the occasional operator. It is not solely for cases in extremis, where any procedure is fraught with grave danger, nor should it be employed where local anesthesia is satisfactory or a general anesthetic can be given with greater safety. It is distinctly contraindicated in patients with low blood pressure who may do better with nitrous oxide oxygen, but in the average major urological operation with damaged viscera we believe it to be the anesthetic of choice.

Next to the fall in blood pressure, the most serious objection raised against stovaine at present is the occasional occurrence of headache. This, however, is much less rare than with the earlier technic and usually yields to the application of an icecap and lowering the head.

Before taking up the application of this method to the individual case we will consider the advantages common to all types of operation:

1. There is no preanesthetic nor postoperative struggling.
2. No retching and tossing about of the patient, stirring up reactionary hemorrhage, and endangering the security of pedicles.
3. No enforced abstinence from water but the ability of the patient to drink before, during, and after the operation. This is an advantage of vast importance in all affections of the urinary tract.
4. A more perfect relaxation than that given by any other form of anesthesia.
5. An absolute nerve block which excludes afferent shock producing impulses.
6. The absence of bleeding and capillary hemorrhage so frequently seen as the result of the increased blood pressure when ether or nitrous oxide has been employed.
7. No added strain from the elimination of a general anesthetic, which in a septic case may dangerously overload a patient barely staggering along under his handicap.
8. No visceral irritation is observed. Kidney function is not affected except by the transient fall of blood pressure(3-5-6).

Prostatectomy.—This is possibly the best field for the use of this method of anesthesia. We hear entirely too much of the innocuousness of a whiff of gas and the ripping out of a prostate in a few minutes. There are freestone peaches and clingstone peaches and prostates may be similarly classified from an operative viewpoint. The ideal relaxation furnished by this anesthesia allows of thorough retraction without bruising so that the prostatic bed may be easily inspected, for hemorrhage and the removal of all prostatic tissue assured. There is no necessity for hurry and the time spent will be well repaid by an absence of late obstruction at the vesical outlet consequent upon an incomplete removal of the gland. The resulting wound does not resemble the trauma caused by a high explosive shell and granulates in a minimum of time. The patient may be flooded with water by mouth and none of the usual postoperative aids need be postponed until he recovers from the anesthetic. Many old men dread general anesthesia and find this method particularly pleasant. It is equally available for the suprapubic and perineal operations and as a general rule is neither preceded nor followed by morphine. The older prostatics with myocarditis and arteriosclerosis need the closest watching since they are poorly equipped to adapt themselves to great variations in blood pressure. The anticipatory injection of pituitrin furnishes an added safeguard to these patients. They are the worst risks under spinal anesthesia but nitrous oxide oxygen is also dangerous, as pointed out ten years ago by Miller (7) and the latter anesthetic with its accompanying high blood pressure not only strains the cardiovascular system but prolongs the operation by causing hemorrhage and favoring muscular rigidity.

Nephrectomy for renal tuberculosis is also a good indication for this method. Ether is not advisable since it irritates the lungs and nitrous oxideoxygen does not give that absolute relaxation of the abdominal wall that is so desirable in this procedure. The injection is made in the second lumbar interspace and is combined with scopolamine morphine anesthesia if the function of the remaining kidney is sufficient as is usually the case.

Vesical and renal calculi and tumors offer an excellent field for the method on account of the great muscular relaxation and freedom from hemorrhage.

Carcinoma of the penis requiring extensive and prolonged dissection furnishes an additional indication for spinal anesthesia.

Urethral strictures in old alcoholics with damaged kidneys do badly under ether but very well under this method since their cardiovascular apparatus is usually in much better shape than in the elderly prostatics. We use it almost invariably for our urethrotomies in these patients and can strongly recommend it. In emergency cases it is invaluable.

My personal experience with spinal anesthesia in general surgery commenced in 1908 and since then I have used it several hundred times and can recall no case in which a fatal outcome could be attributed to the anesthetic. Since 1916 I have used it in the majority of my prostatectomies, in six nephrectomies and in ten external urethrotomies. Chute and Smith (8-9-10) use spinal anesthesia with novocaine in practically all their suprapubic prostatectomies and for cystoscopies in irritable bladders. Judd (11) used stovaine spinal anesthesia in a series of cases but gave it up on account of headaches which seemed to follow its use. He began its use after Jonnesco's visit. In recent years he mentions one death which he definitely attributes to the anesthetic, and a few cases in which there was such a marked reduction in the blood pressure that the patients were in an alarming condition for some time. Braasch (12) writes: "Spinal anesthesia with novocaine is being used by Dr. Hunt in his prostatectomies." They are not using spinal anesthesia for kidney work at the Mayo Clinic. At the Samaritan Hospital, where most of my work has been done in recent years, we have unique opportunities for the study of this method and every one is familiar with the pioneer work of Babcock (13) and Steel (14).

In conclusion, I would state that every patient under spinal anesthesia should be carefully watched by an assistant trained in the technic. We urgently recommend every urological surgeon to study carefully this method of anesthesia as now practised, use it in properly selected cases, and then form his own conclusions.

1501-2 MEDICAL ARTS BUILDING.

The references will appear in the author's reprints.

The Treatment of Syphilis

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This is not an attempt at an exhaustive paper on the subject, but merely a résumé of a method which has been found most useful in practice, and which, up to date, has given satisfaction in the hands of those who have employed it. A reference to current literature has been omitted in most instances, for the sake of brevity, as has likewise a discussion on the cause of syphilis; but it may be remarked in passing that recently McDonagh, of London, has called in question the existence of the Spirochæta pallida; he regards it as simply a stage in the life cycle of the organism, which is the cause of syphilis. That may or may not be correct, but we do know that syphilis, whatever be its true cause, is a definite, pathological condition, with a most variable and elusive symptomatology, and it is with the recognition and treatment of these symptoms with which we are at present concerned.

Time and scientific investigation have produced many methods and forms of treatment; some have held sway for a considerable time, but sooner or later all have been relegated to the medical history shelf, with the one exception—mercury, which alone has stood the test of time. Thus, in 1922, we are still forced to admit that mercury in some shape or form is our only refuge, and the words of the great John Hunter are as true today as when they were uttered one hundred and fifty odd years ago, to the effect that if ever there was a specific for syphilis, mercury is the drug.

To quote a more modern authority, White and Martin said some years ago that the surest method of cure then known was to give a patient the largest dose of mercury possible over the longest possible period of time without the patient being aware that he was taking it. They believed from their experience that if such treatment were continued for from three to five years, the patient could consider himself cured; that is, provided that all clinical manifestations of syphilis had disappeared and had remained absent for two years.

In view of further experience and investigation it would be more correct to say that patients should have an uninterrupted five years' course of treatment, and an antisyphilitic course of treatment for one month every year of their life ever after, if they wished to guard themselves, as completely as possible, by means of the methods of treatment at present at our disposal, against any of the tertiary disasters that so commonly follow in the wake of inadequately treated primary specific mischief.

It is also to be borne in mind that inadequate treatment of the primary lesion not only renders probable the formation of a gumma, a very unfortunate sequela, but it is not generally recognized that the gumma is, much more often than thought to be, the point of origin of a carcinoma.

Much more frequently than is generally believed malignant disease is superimposed upon an already existing tertiary condition. That can be proved by the fact that, under specific treatment, instant and marked improvement occurs up to a certain point, and then ceases.

It is difficult to imagine anyone in practice who has not come into touch with these desperate and pitiable cases, for whom nothing can be done but mitigate their sufferings for the time being, and give them as easy a death as possible. In view of that fact it will be seen how important it is that all the means and methods at our disposal should be utilized to the utmost to produce, as far as possible, an absolute, complete, and permanent cure. No trouble should be spared and no time grudged on the part either of patient or surgeon in order to attain what may truthfully and correctly be called this perfect and ideal life saving result.

Before commencing treatment in any case, it is essential that a diagnosis should be made, and, as in treatment, so in the case of diagnosis, many methods have been evolved, but none have been found infallible. Among the many methods which have been introduced may be mentioned the Wassermann reaction. McDonagh's gel test, and the lutein test —all more or less reliable, but none infallible. Recently the Mayo brothers have introduced what they call the provocative Wassermann reaction.

Let it be said now that the nearest approach to perfection that has been reached in diagnostic methods is by means of what might be called the clinical test, which has without doubt been depended upon and carried out by many for years, with satisfaction to the patients and to the profession. In this test no complicated or elaborated technic is necessary, so that the chances of error are reduced to a minimum, and the most important point is that it is within the reach of everyone.

The rationale of the test is as follows: A patient complains say of vague pains in his arms or legs, or persisting or recurrent neuralgia, or pains all over his body, that will not respond to any of the various forms of treatment that may be administered, and another class of obscure cases is one in which the patient complains of a certain amount of irritation of the skin, that does not properly react to treatment, but recurs from time to time to the annoyance of everyone.

In cases of this description, on going carefully into the history, it will often be found that there was, twenty or thirty years ago perhaps, a small sore on the privates, that resolved to treatment, rapidly disappearing in a week or two, and never since being the cause of any trouble; or it may have disappeared without any treatment at all; or the patient remained well until the commencement of the present condition.

In many of these patients one is undoubtedly dealing with a mild early tertiary lesion. If the Wassermann test is performed, it may be positive, negative, or both, and is therefore of no help at all. The same may be said of other tests; what then can one do? In such a case put the patient upon four weeks' active and energetic antisyphilitic treatment, and if there is any syphilitic infection present the result will be, if not a complete disappearance of all symptoms, at least such a marked improvement as to leave no doubt in the minds of both patient and practitioner as to what the cause of the condition is. It might be argued that mercury is beneficial in conditions other than specific. If it is, so much the better, and, properly administered, it will not do the patient the slightest harm.

In the case of primary sores is it not much easier to look for the spirochætæ, and at the same time give active constitutional treatment, and even if the spirochætæ are not found, the lesion clearing up in a few days under the constitutional treatment, what better proof of the specific nature of the lesion is wanted? Is it not better to err on the safe side by giving the patient a thorough antisyphilitic course of treatment that will protect him against an incipient and incurable tertiary lesion, than to trust to a test tube reaction that is known to be variable and unreliable? To illustrate further the danger of depending solely upon test tube reactions, the two following cases may be quoted:

A lady struck the front part of her leg, just below the tibial tubercle, on the step of a stair of a tram car, in January, 1918. In March a swelling appeared at the seat of the blow; it increased in size, but was painless for the first two weeks; then, as the skin became definitely involved, pain ensued and became almost unbearable. She was seen by a surgeon who had the Wassermann test performed. It was negative. He incised the swelling, but no pus was found. It never completely healed, and in May, 1918, another swelling made its appearance, one inch below the primary one, and then fused with it. She was seen by another surgeon who also had a blood test performed, with like result, and, upon obtaining same, he advised immediate amputation of the leg at the junction of the middle and lower thirds of the thigh. This was refused, and when seen in July, 1918, a large fungating mass was found, with marked swelling of the underlying portion of the tibia. A stereoscopic x ray photograph showed a mass in the soft tissues extending down to and continuous with the upper part of the shaft of the tibia. It was decided that it was a tumor, the exact nature of which it was impossible to determine.

An anesthetic was administered and three pettions were removed and carefully examined, but a definite decision could not be arrived at. By this time it had increased considerably in size, and was extending down the front of the leg. In spite of the fact that no history of syphilis could be obtained, it was decided to try the effects of antisyphilitic treatment. Colloidal mercury was given intramuscularly and also by the mouth, and in a few days marked improvement was observed. An intravenous .3 injection of salvarsan was given, and in ten days from the commencement of the treatment the swelling had disappeared, and only a small ulcer, the size of a penny, was left. Another dose of salvarsan was administered and a week later the leg was completely healed, and the patient was dismissed. Infection fourteen years previously was now admitted, and at the time of writing, while still under treatment, she has remained perfectly well. Thus, if a clinical test had not been made, this patient would have lost her leg and possibly her life.

In another case seen two months ago the patient, a male, had large nodes on the tibia, and ulceration of the legs, which had been treated with various remedies but without result. He had six Wassermann reactions performed, all negative. He was at once put on treatment, with immediate results; the bone pains ceasing and the ulcers healing rapidly. He admitted infection seven years previously and had had two years' treatment.

The treatment properly given is neither irksome nor dangerous, and is a small price to pay, compared with the risks that its neglect entails. While any form of mercury given in sufficient doses over a sufficiently long period of time will cure syphilis, there are many different ways of administering it, and the one which can be best tolerated by the patient should be chosen. At the beginning of the treatment the patient should be carefully overhauled by a dentist, by whom all teeth beyond saving should be extracted, and those in the slightest degree carious efficiently stopped; in fact, a patient under treatment should visit the dentist at least once every six months.

The form of treatment which has been found most effective and lasting has been the combined administration of mercury and salvarsan.

Mercury is administered orally or intramuscularly; salvarsan intravenously. The case having been diagnosed, the patient is at once given an intravenous injection of salvarsan. This drug properly administered, and in appropriate doses, is a valuable aid to cure; its effects are not permanent, but it rapidly clears up symptoms. In some cases the primary rash disappears in forty-eight hours. It has been administered intravenously, intramuscularly, and rectally, but the intravenous method is without doubt the one of selection. When given intramuscularly it is not absorbed but forms a hard indurated painful mass at the site of injection, that for some reason or other often becomes septic and forms a troublesome and painful abscess. Rectal administration has not been very successful and is not now much practised.

As already mentioned, the method of choice is intravenous injection. This method is rapid, reliable, and, under proper conditions, safe. The following is the apparatus technically required: 1, 300 c. c. graduated glass cylinder; 2, eight feet of rubber tubing; 3, glass window for same; 4, a record needle; 5, twelve glass beads; 6, a glass stoppered bottle, of six ounce capacity; 7, one dram measure; 8, filter; 9, cord, pulley, and frame for raising and lowering the solutions; 10, elastic tourniquet; 11, clamp for rubber tube.

The 300 c. c. graduated glass cylinder has an eversion of the rim so that it fits into a wire frame by means of which it can be raised or lowered. Its lower end is drawn into a neck, narrowest about its centre and broadest at the very end, to prevent slipping of the attached rubber tube.

The rubber tubing is in two pieces, one six feet and the other two feet in length, connected by a glass window. This window serves two purposes; by means of it the fluid is seen just before it enters the vein, and, if the blood flows out, it is there observed.

The needle, which is of the record type, fits into a holder, that is formed of two parts; the one part is made to fit the rubber tube, and is separated from the other that receives the needle by a flange whose duty it is to prevent the rubber tube from slipping forward. The part that receives the rubber tube is thickened at either extremity, and grooved at the centre, so as to give a firm hold to the ligature that fixes the tube. The needle is of .9 mm. bore, and it is found that by using one of this calibre, shock is practically never seen.

Twelve to twenty solid glass beads are useful, but not essential, since, if the drug is properly added to the distilled water, it at once dissolves. A ground glass wide mouthed bottle, with a glass stopper, and of a six to eight ounce capacity, is required for mixing the solutions.

The one dram measure is for the caustic soda solution. The filter is of very close meshed Japanese silk, and is fitted in a double iron frame. The pulley is fixed at from ten to twelve feet above the level of the patient on the table, with the raising and lowering cord of about double that length. The tourniquet is an elastic bandage, two and a half inches in width and three feet in length, which is much kinder to the tissues than the unelastic type, and causes the patient not the slightest discomfort or pain. The clamp which is used for the rubber tube is of the screw variety, and is the most convenient for use, as by its means the flow of the solution into the vein can be accurately regulated.

The whole apparatus, with the exception of those numbered nine and ten, is sterilized in the same way as instruments are for an operation. The parts as required are then put together, and the funnel filled with saline, so that it is kept warm, making sure that there is no air in the tube. The solutions required are sterile distilled water, fifteen per cent. caustic soda solution, normal saline.

The patient is prepared as for an operation, and, if possible, should remain in bed for twelve hours prior to, and the same time after, the injection. During the time of waiting he should have no solid food. The best results have been obtained in cases in which the patients have been kept on a diet of milk for twenty-four hours. In these cases not the slightest reaction or untoward symptom of any kind has been observed. The arm is prepared by washing with turpentine the area of skin that is over and around the vein that is to be used, which is carefully dried off, and the part then washed with spirit. The solutions should always be freshly prepared for each patient, and administered at once. The mixing bottle is taken and one ounce of the sterile distilled water poured in. The tube of salvarsan, say a .3 dose, is next taken; the neck of this is cleansed with spirit and dried; it is then filed and broken off. The powder is now shaken, very gradually, into the sterile distilled water, the shaking motion being continued as the powder dissolves on its gradual addition. When all has been put in, the bottle is given two or three vigorous shakes, to make sure that a perfect clinical solution has been obtained; a perfectly clear pale yellow solution should be the result.

This solution must now be neutralized by adding to a .3 dose twenty minims of the fifteen per cent. solution of caustic soda. This is added at once, not drop by drop; on addition, a thick yellow precipitate immediately forms, but in like manner disappears with a few gentle shakes of the bottle. The precipitate now dissolved, the normal saline solution is added, so that the total quantity of solution now in the bottle is between 250 c. c. and 300 c. c. As a matter of fact a dilution of the salvarsan solution with normal saline up to 200 c. c. is found very satisfactory in practice. The temperature of the solution is best maintained around 60° C., it cools very rapidly, but if given at this temperature the tendency to shock is to a large extent obviated.

The 300 c. c. glass cylinder and the rubber tubing are now full of saline, which is run off to within half an inch of the bottom of the cylinder, so that only the rubber tubing contains the saline. The solution is now put through the strainer into the glass funnel, and is thus ready for introduction within the vein. It is sometimes difficult to find the vein, but this can usually be assisted by rubbing the arm with ether; this brings the vein into prominence. The tourniquet is applied over the lower third of the biceps muscle and held in position by an assistant or the end clamped to the preceding turn by a pair of ordinary pressure forceps, and is released immediately after the needle has been introduced into the vein. Because of its elasticity, the tourniquet, on removal of the forceps, will unwind itself. To introduce the needle into the vein, hold the rubber tube, with the needle attached, firmly in the right hand; with the left hand put the skin on the stretch, so that it is made tight and steady; then introduce the needle, through which the solution is flowing, into the vein.

The needle should be inserted at approximately a vertical angle of 45°, and, immediately on entry of the vein, brought almost to the level, so that the lumen of the vein may be easily entered, and the danger of pushing the needle through its posterior wall and the surrounding tissues be more easily avoided. If the needle should miss the main channel, there will develop a swelling at the point of puncture, and it will be noticed, as the local pressure increases, that the solution in the glass cylinder will not be moving. The needle must then be at once withdrawn and reentered properly within the vein. On entry the glass cylinder containing the solution should be at a height of three feet above the level of the patient. As the solution is flowing it should be gradually raised, about one foot every two minutes, till it reaches a height of six feet above the patient. The solution takes on an average from fifteen to twenty-five minutes to flow in. If it is introduced at any greater speed the dangers of shock are markedly increased.

With the solution properly prepared, in a properly prepared patient, there should be no complication, but every now and again such will ensue, and may be divided into two classes, namely, those occurring at the time of the adiminstration and those that develop within the first twelve hours after. Those that occur at the time may be described as shock, collapse, and vasoparesis.

Shock is most frequently seen in young women and those who are of a nervous temperament. The treatment in these cases includes stopping of the injection, lowering the head of the table, and giving brandy by the mouth or an injection of pituitrin. In such a case the patient should be placed back in bed as soon as possible and surrounded with hot water bottles, the end of the bed being raised by a foot block, and as a rule the patient recovers completely within an hour.

Collapse is sometimes met with when the patient has had about 100 c. c. of the solution. They first complain of feeling warm, then of faintness. The pulse and respiration become weak, and if the injection is not discontinued a fatal end may result. The treatment in these cases is the same as that for shock, but it should be more energetic, and, in addition, artificial respiration and direct cardiac stimulation may have to be employed. A rectal injection of strong coffee, two ounces, along with an ounce of brandy, is helpful. As a rule these patients recover, but they must be kept in bed for the following twenty-four hours; or, otherwise, they may have some recurrence of these symptoms.

Vasoparesis is a condition in which the patient suddenly becomes much flushed, complains of feeling very hot, and then is dizzy, sick, and faint. This condition may be toxic or neurotic, most frequently the latter, and a differential diagnosis between the types may be made, as will now be explained. It will be remembered that when describing the technic of the preparation of the solution it was advised to fill the funnel and tube with the normal saline solution, so that when the needle enters the vein the patient is receiving normal saline.

The large majority of cases of vasoparesis are of neurotic origin, and occur within two minutes of the needle having been inserted into the vein. As the patient is receiving saline we are thus certain that his condition is a neurotic and not a toxic one. Hence the advantage of first admitting a few c. c. of saline. There are two other advantages gained by giving saline first; it diminishes liability to shock, and if by any chance the needle should not have entered the vein, the saline will not irritate the subcutaneous tissues, as salvarsan will to a very marked degree. If the vasoparesis is of toxic origin, it manifests its presence after the patient has received between 25 c. c. and 100 c. c. of the solution.

The delayed complications are sickness, vomiting, general headache, diarrhea, rigors. The sickness and vomiting are treated by the usual methods and the headache by ten grains of aspirin. They are usually transitory and pass off within a few hours of their appearance. Rigors are sometimes seen, and are treated by means of hot drinks, warm rectal salines, and hot water bottles. The diarrhea usually disappears after a dose of opium, and gives no further trouble. Thanks to improved technic, and smaller doses, these complications are nowadays rarely seen, and when they do make their appearance will usually be found to be the result of some error in the technic of the preparation of the solution, or in its administration. There are other complications, but space forbids a consideration of them.

It has been calculated that, according to this method of treatment, a patient should receive four injections the first year, three the second, two the third, one in the fourth, and one in the fifth year; thus making a total of eleven injections, and these, on each visit, increased by a .3 gm. dose; the patient will then have been given 3.3 gm. of salvarsan. As already mentioned, the effects of this drug are temporary, not permanent, and therefore more is administered intramuscularly in its colloidal form and also by the mouth.

During the first year the patient has fifty-two injections of five c. c. doses of colloidal mercury, forty the second, thirty the third, and twenty-five in the fourth, and also in the fifth year; thus making a total of 860 c. c. of colloidal mercury.

The preparation used is easily given and painless, causing not the slightest inconvenience to the patient. The mercury is supplied in bulbs of five c. c., and an aseptic tube of normal saline, one c. c. Break off the neck of the mercury bulb and both ends of the bulb of the saline tube, putting the latter into the mercury; the colloidal mercurial is thus rendered isotonic. A record needle is now taken, and the total six c. c. drawn up into it. The part in which to administer the injection is the gluteal region, and this is first treated with iodine. Grasp firmly the tissues between the thumb and forefinger of the left hand, and smartly plunge in the needle, for an inch, and then slowly inject the solution, and afterwards withdraw the needle. The small puncture is sealed with collodion, and no further trouble is ever experienced.

The method of administration is as follows: First day, one tabloid; second day, two tabloids; third day, three tabloids. On the fourth day none are taken. The treatment is resumed thus: fifth day, one tabloid; sixth day, two tabloids; seventh day, three tabloids, eighth day, four tabloids. On the ninth day none are taken, the treatment being again resumed on the tenth day.

The point to observe is that the patient increases the dose by one eighth of a grain a day and continues for one day longer each time, after the one day interval. When he reaches twelve tabloids a day, he leaves off the treatment for three days before again resuming at one a day, and when he succeeds in taking up to twenty a day, he takes a rest from all treatment for one week. He then continues the course without interruption for at least five years.

While some patients are able in time to consume twenty to thirty tabloids a day without any ill effects, the average number that can be comfortably taken is found to be about eight a day. The results of this method of treatment up to date have been highly satisfactory, and while it is perhaps too early to state that a definite cure has been established, all that can be said is that no relapses have been observed so far; and, what is more important, no disasters following upon the treatment have as yet been encountered. While it is not affirmed that this is the perfect treatment, it is to be hoped that it may, if nothing else, give us something definite to go upon, and stimulate others to perfect a method that may release us from the everchanging and uncertain methods that are at present in vogue; something safer, more reliable and definite.

17 LYNEDOCH CRESCENT, CHARING CROSS.

The Diagnosis, Interpretation, and Biological Treatment of Renal Disease

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For practical purposes of study and treatment, nephritis may be classified as acute and chronic. The acute forms of nephritis are secondary to some acute inflammatory disease, as typhoid, scarlet fever, pneumonia, and general streptococcic infection. Acute nephritis is not considered in this paper. It is a significant fact, however, that after the febrile symptoms of the acute inflammatory disease have subsided the renal lesion usually improves, but there are many instances in which the renal condition changes from an acute to a chronic degenerative process, and persists after the primary lesion has resoluted.

Chronic degenerative renal disease is classified into the various types depending upon the character and the location of the lesion, as chronic parenchymatous nephritis, chronic interstitial nephritis, tubular, glomerular, arteriosclerotic, large white kidney, and secondary contractile kidney. It is reasonable to assume that in all probability these various lesions are but different stages of the same process, and if the patient survives long enough he will have most of them.

The etiological factor in the majority of cases of the chronic forms of nephritis is some low grade infection of the nose, throat, teeth, and respiratory tract or occult infections of the gallbladder and intestinal tract or a combination of all. Chronic alcoholism may be a factor but it would appear that it is not directly responsible for nephritic conditions. It is my belief that alcohol stimulates the drinker to eat the wrong kinds of food and to be very careless about his oral and intestinal hygiene. In this way alcohol promotes a predisposition to an infection of the digestive tract and these infections are responsible for the majority of organic lesions whether they are located in the kidney or elsewhere.

Chronic kidney disease is a systemic disorder in which practically every cell of the body is involved. It is a disease in which it is possible always to demonstrate some manifest functional or organic change in the heart, the arteries, and certain ductless glands. If we were as efficient in demonstrating functional and organic disorder in the liver, the spleen, the brain, or any other organ or structure as we are able to do in kidney disease, it would be found that there would be concomitant alterations in their structure and function. In a given case of chronic kidney disease, the most manifest disorder of function or structure may be found in the heart, arteries, or kidneys. For practical purposes it does not matter to a great extent which of these three tissues exhibits the most manifest structural change.

The test for albumin, casts and specific gravity, as usually made, are of little value in determining the nature or the extent of the renal lesion. It is a well known fact that the urine may give a test for albumin, when there is no apparent pathological condition involving the renal structures. Therefore, before attempting to estimate renal deficiency, it is necessary to understand the function of a normal kidney.

The normal kidney can eliminate promptly unusual quantities of water and salts. This power is known as kidney reserve. Due to this reserve power, all of the waste products are eliminated promptly during daylight hours. However, if acute or chronic systemic infections are present, the kidneys are overworked and the kidney reserve will be diminished in time. When the kidney reserve is below normal, urination takes place at night. Night urination is one of the first signs of kidney failure. When the kidney reserve declines, the kidney loses the power of excreting large amounts of salts in a small amount of water and we find that the kidneys are obliged to dilute the various waste salts with much water. This explains why the urine has a low specific gravity.

If samples of urine from a diseased kidney are collected every two hours, the nitrogen and salt excretion as well as the amount of water eliminated will be practically constant for each collection. The inability of the kidneys to excrete the varying loads of water and salts is known as fixation. The more constant or unvarying the amount of salt and water eliminated in the two hour test, the more serious is the renal impairment.

In order to estimate the functional capacity of the kidneys we resort to two tests; one being the phenolsulphonephthalein test. This dye, when injected into the body, is promptly eliminated by the normal kidney, that is, sixty per cent. of the amount of dye injected is eliminated within two hours. If the kidneys are defective, the elimination of the dye is diminished. The other test, which is the most reliable, is the estimation of the urea, creatinine and chloride content of the blood.

Urea is an end product of protein food and tissue metabolism. The normal blood contains from twenty-five to thirty-five mgs. to 100 c. c. If the kidneys are impaired, the excretion of urea is depressed and there is a resultant retention of this product in the blood, so that there may be a retention of from fifty to 400 mgs. to 100 c. c. Creatinine is a nitrogenous waste product of cell metabolism. Normal blood contains from 0.5 to 1.5 mgs. to 100 c. c. Creatinine is eliminated readily by the kidneys and its presence when over 1.5 indicates that there is serious impairment of the functional efficiency of the kidney. Sodium chloride is eliminated readily by the kidneys. Normal blood contains from 500 to 550 mgs. to 100 c. c. When the kidneys fail to eliminate this chloride the patient becomes edematous, due to disturbances of the osmotic balance.

There does not appear to be a direct relationship between the extent of the pathological damage and the functional capacity of the kidneys. The condition of the patient may be judged by the degree of functional capacity or incapacity rather than by the pathology as indicated by microscopic findings. When a patient suffering from renal disease presents himself for study and treatment one should measure the functional capacity of the kidneys and determine and eliminate all sources of infection.

In these reserve minus kidneys, a careful search for foci of infection will reveal obvious and occult foci of infection. These foci, obvious or occult, are either actively, passively, chronically or exacerbatorily operative in almost every instance of diminished or deficient renal reserve.

Digestive tract infections are found between the mouth and the anus inclusive. The presence of an extensive dental, tonsillar or sinus infection, is almost proof positive, in many instances, that there is an associated colon infection which may or may not be associated with a gallbladder infection (1). It is useless to describe the methods for the determination of focal infection about the teeth, tonsils, sinuses, or respiratory tract. The Wassermann test usually demonstrates the presence or absence of luetic etiology, which should always be considered a potent causal factor.

The occult infection sites are, broadly speaking, the gallbladder and the colon. They are inaccessible to the average methods of examination and treatment.

In my work, gallbladder and colon infections are found to be associated with existing or preexisting infections of the upper digestive and respiratory tract. Infection of the gallbladder or colon may exist without being associated with an upper digestive or respiratory tract infection, yet, this is by no means the rule. A complete history of the patient's past will demonstrate graphically that the patient's biological past is responsible for his biological present.

Gallbladder infections are determined by the nonsurgical mechanical drainage of the biliary tract after the method which has been so capably outlined and presented by Lyon (2). The study of the cytology, of the consistency and the bacterial picture of the biliary contents obtained by intraduodenal drainage, furnishes one with first hand information as to whether or not there is present a focus of infection in the gallbladder, and in many instances it is possible to demonstrate the presence of biliary tract pathology that escaped detection by the x ray examination. It is a diagnostic as well as a therapeutic measure.

The symptoms of gallbladder infection are variable. In some instances there may be an extensive inflammation of the biliary tract with but few symptoms, and on the other hand there may be but slight involvement of the biliary tract with a wealth of local and constitutional symptoms. Lyon's method is a means of obtaining evidence for establishing definitely a diagnosis.

Infections of the colon may or may not be characterized by symptoms referable to this structure. The history of appendicitis, hemorrhoids, fistulæ, fissures, pruritis, mucous colitis, rectal pains, constipation, attacks of diarrhea, etc., are characteristic symptoms of some infection involving either the contents or the structure of the colon, or both. Stool examination obtained from a freely drained colon, which represents the bacterial life of the higher levels of the colon, upon stained smear and culture studies, will reveal the true bacteriological picture of the intestinal flora (3). It is possible to determine by this examination whether or not the process is putrefactive, fermentative or pyogenic. From a study of the cytology, one is able to determine in a large measure the extent of the inflammatory involvement of the mucosa, and from the consistency of the specimen one is able to judge the degree of stasis present.

It is not within the scope of this article to indulge in a detailed discussion of the intestinal flora, and it is briefly mentioned so that its importance in the production of renal states may be apparent and that the method of treatment may seem logical. It has been my observation that the same organism which may have infected any of the tissues of the upper digestive tract, may be found in the fecal contents; showing that it is possible to transfer directly the infection from the upper to the lower digestive tract. This also explains why the removal of teeth and tonsils does not improve the patient if the lower digestive tract infection is ignored.

If it is found that infection sites are operative in the gallbladder or colon, the following therapeutic method is outlined to combat their presence:

1. Removal of infection sites in the upper digestive and respiratory tracts.
2. Nonsurgical mechanical drainage of the biliary tract or colon, or both.
3. Acidophilization of the intestinal tract by the oral administration and rectal instillation of viable cultures of the Bacillus acidophilus.
4. Individualized dietary régime supporting the acidophilization of the intestinal tract.
5. Autogenous vaccines in selected cases.

The nonsurgical mechanical drainage of the lower digestive tract (gallbladder and colon) is a means for removing the infected contents from these structures, numerically diminishes the pyogenic types; removes the pabulum of the harmful organisms; washes out toxic secretions and creates an environment unfavorable to the perpetuation of the harmful strains of microorganisms and favorable to the helpful forms of bacteria. It is possible by these means to simplify rapidly the complex fecal flora characteristic of lower digestive tract infection from within three to five days (4-5). The flora is kept simplified by a diet composed of the protective types of foods, that is, fruits, vegetables, grains, nuts, milk, and a slight amount of proteins when the patient is rid of his infection. This diet furnishes the proper food for the growth of the protective forms of bacteria, that is, the colon bacillus, Bacillus lactis aerogenes and the Bacillus acidophilus.

The patient is given large doses of Bacillus acidophilus milk (6) and the dosage is maintained until there is a sixty to seventy-five per cent. domination of the acidophile types, at which point the dose is dropped to half the original amount and the acidophilus domination is determined by subsequent bacterial differentials. The percentage of acidophilization is dependent in a large measure upon how well the patient adheres to his diet.

Autogenous vaccine is believed to be of great value in the long standing cases of digestive tract infection in which there has been an extension of the pyogenic infection to the intestinal lymphatics.

SUMMARY.

The biological therapeusis outlined for renal disease is based upon an almost constant demonstrability of the presence of digestive tract foci of infection in every case of renal disorder.

The orthodox treatment of renal disease is notoriously inadequate. It has been aimed at the kidney and has too often harmed the kidney. Renal pathology is the result of infectious processes and the logical therapeutic endeavor should be to correct or eliminate the causal factors. The Allen treatment has its merits, however, used without eliminating digestive tract foci of infection it is found to be inadequate in many instances.

The principle outlined in this article for the treatment of renal disease embraces a process of concomitantly disinfecting and detoxicating the digestive tract throughout its entire extent. It involves a cardinal physiological principle, drainage, which should be incorporated in medical as well as surgical principles of treatment. One simply reopens the natural drainage avenues and attempts to keep them open by hygienic means. And last, but most important, the patient is educated to eat the proper foods, to realize that an excess of carbohydrates and proteids are harmful and does not meet the nutritive needs of a protective intestinal flora as well as the needs of tissue metabolism.

Disinfection and detoxication of the digestive tract offers a direct approach in treating the chronic renal degenerations. It removes rapidly and efficiently the toxic load from the kidneys and prevents the formation of another excessive toxic load.

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265 WEST SEVENTY-SECOND STREET.

An Unusual Case of Renal Calculi

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I wish to report and discuss an interesting case of renal calculi.

CASE.—V. P., aged twenty-two, born in the United States of Italian parentage, clerk in an express office, father and mother both alive and well. One brother, aged twenty-eight, alive, with history of rheumatism.

The patient had had measles, whooping cough, and scarlet fever as an infant. Had been a meat eater, having eaten meat twice a day, usually veal. He denied any venereal history. He smoked incessantly.

About six years ago he complained of pain, rather severe, on his right side, nausea and vomiting, with fever. He was sent to the hospital and operated upon for appendicitis. Since the time of this operation he has always complained of more or less backache, especially on the right side. About three years ago he was x rayed for a suspected calculus. The x rays were negative. Six months ago he contracted a severe case of mumps. There subsequently developed right testicular enlargement (orchitis), which gradually subsided. His backaches then became worse, particularly upon exertion. For the past six weeks this pain had been getting very severe and coming on more frequently, becoming almost unbearable, starting at the right costovertebral angle, radiating forward toward the testicle, causing the testicle to retract. At times nausea accompanied these paroxysms. Slight motion increased the frequency of these paroxysms, and often he had to stop while walking. Symptoms lately had become practically continuous, no hematuria ever being present. He had never passed a stone to his knowledge. Urination was rather frequent, a little at a time, dark in color. Physics often gave him relief. Rest also gave him almost complete relief. The condition complained of became acute within the last four or five days, when even upon resting the pains became unbearable.

The patient was a strong looking well built man of perfect physique, good color, well nourished, with clean tongue, fair teeth, some pyorrhea, and diseased tonsils. His heart and lungs were normal; pulse 72, regular, good quality and rhythm, tension normal, heart borders normal, apex beat the fifth intercostal space inside the nipple line, no adventitious sound, systolic pressure 130, diastolic pressure 70, pulse pressure 60. The temperature was normal. A linear scar about six inches long was present at the outer border of right rectus (no drainage was used at time of operation). The reflexes were normal. The stomach was negative, liver negative, spleen negative. Upon deep pressure one hand over the right hypochondrium, and the other over the right lumbar region, I could palpate the lower pole of the kidney and the pelvic border rounded especially upon deep inspiration. A sudden thrust of my right index finger in the right hypochondrium produced severe pain.

The blood was normal, 4,500,000 red cells, white cells 9,000, and sixty-eight per cent. polynuclear.

On December 6, 1921, the urine was moderately acid, specific gravity 1.016, slight trace of albumin, sugar negative, urea 1.4 per cent., chloride fifty-five, total solids 3.7, leucocytes moderate, eight to twelve found in a field, erythrocytes occasional, a few squamous cells, a few cylindroids, a few calcium oxalate crystals seen. I advised a careful study of the case, x ray examination, cystoscopy, and hospital observation. I had an x ray taken. This showed definitely three moderate sized calculi in the right renal pelvis. A close examination of the films seemed to show suspicious looking shadows in the lower pole, and I thought that this might mean further stones. The left kidney x ray was negative, ureters and bladder were clear. I advised cystoscopy and sent the patient to the Columbus Hospital to which he was admitted December 8, 1921. He was prepared and cystoscoped by Dr. Begg about 3 p. m. on December 9, 1921. He was very apprehensive about his condition. Upon admission to the hospital he was in good condition. The patient was placed upon the operating table and a Buerger Brown cystoscope was used. The meatus was normal in size. The instrument entered readily. The bladder wall seemed to be congested, right ureteral orifice was reddened, left ureteral orifice normal. The catheters were passed into both ureters without any difficulty, no obstruction was noted in either kidney, urine dripped slowly from the left kidney, and more rapidly from the right kidney. Phenolsulphonephthalein was injected intravenously and appeared in left ureteral catheter in about four minutes. It appeared in the right in about four and a half minutes. The right then flowed more profusely. During this procedure I noticed the pulse becoming irregular, pounding, and I called the attention of Dr. Begg to this. The pulse became jerky and of poor quality. There were many extra systoles. The pulse then suddenly became thready. We discontinued the examination and put the patient to bed. While the patient was on the table his pulse was as low as forty a minute and irregular. When he was put to bed the pulse became fast and irregular. I gave the patient ten minims of tincture of digitalis every six hours.

The advisability of operation was now under consideration with this condition of the heart action; although there were positive findings I hesitated to proceed. I then took up the question of the x ray, particularly the question of this doubtful shadow, and the desirability of doing a nephrectomy. Feeling convinced that this indistinct shadow might mean something of importance—a stone or stones—with this cardiac condition present we agreed to use extreme precaution and have a special anesthetist. It was agreed to proceed and operate December 10, 1921. The heart action still stayed rapid and irregular, but became better and stronger under digitalis and rest. No untoward urinary symptoms were present. The urine findings on this day were slightly alkaline, specific gravity 1.018, faint trace of albumin by boiling and nitric acid, sugar negative, urea 1.6, crystals absent, solids 4.2, few leucocytes, one to two to a field, a few hyaline casts. The result of the functional test was entirely satisfactory for both kidneys. The patient's pulse continued to be irregular and rapid on December 11, 1921. The phenolsulphonephthalein came through both ureteral catheters in normal time.

Report of Dr. Begg's findings of catheterized ureteral specimens.—Left centrifuged specimens showed a large number of caudate epithelial cells together and a moderate number of pus cells, urea, equivalent to fifteen grams to each 1,000 c. c. Right catheterized specimens showed a few caudate cells together and occasional leucocytes. On Monday, December 12, 1921, upon entering the hospital the nurse reported to me that the patient again had a pulse of forty-eight. I found him in fairly good condition. Having been prepared in the usual manner we proceeded with operation. Dr. J. F. Kiernan was the anesthetist and Dr. DeFelici the assistant. Gas, ether, and oxygen were used.

OPERATION.

A curved incision was made from twelfth rib at angle of erector spinæ downward and forward, cutting latissimus dorsi anterior position, partially splitting the external internal oblique. Below this the lumbar fascia were exposed and last dorsal nerve pushed out of the way, the outer border of the quadratus lumborum retracted and the fatty capsule exposed and cut through. The kidney adhered to the fatty capsule. The kidney was moderately enlarged. With the fatty capsule stripped, palpation revealed nothing in the upper pole, also nothing in the lower pole. At the posterior part of the kidney pelvis I could feel calculi. I made an incision in the direction of the ureter, more toward the pelvic portion, and tried to pass the stones through. The first stone presenting itself was large, long, branched, measuring two cm. from tip to tip, lying transversely, entirely different in shape from what I anticipated from the x ray. In disengaging it the ureter was somewhat lacerated in spite of gentle manipulation. I then removed two additional round stones. Upon further search I could not detect any more. I felt some apprehension as to leakage. I could not remove the stone first above referred to without injury to the ureter, as I had to explore for further stones in the pelvis. Not finding any more stones I decided to do a nephrotomy and felt on either side in all directions but could feel no more stones with the gloved finger. Dr. DeFelici did likewise with no better success. In view of the condition of the patient's heart action and in view of the laceration of the ureter by the larger stone, thus making repair difficult, if not uncertain, the possibility of hemorrhage and prolonged leaking from a ureteral fistula, and finding a cavity in the lower pole of the kidney (hydronephrotic area), there still remaining a suspicion that the kidney was still further invaded by calculi, I decided upon doing a nephrectomy as the safest procedure. I proceeded to ligate the pedicle in sections, then *en masse*. A drain was inserted between the muscles. The heart condition was extremely poor, pulse uncountable. The patient was put to bed. Diagalen was given by hypodermic. A saline enema and hypodermoclysis were also given. The pulse still remained irregular. The kidney was then examined. Another section showed many more stones in various calices, branched stones of various shapes and sizes. It was almost impossible to palpate these stones even with the kidney outside of the body. In all there were twenty-one stones found, clove shaped, rounded and branched, throughout the kidney substance. No operation of a lesser magnitude would have been sufficient in this case. The pathological report showed considerable damage done to this kidney. Hydronephrotic areas and chronic parenchymatous nephritis were indicated. The heart action continued to give me great concern. I then consulted Dr. Latin with a view of getting an electrocardiogram. The next day under digitalis in repeated small doses, the heart gradually improved and became regular and slow. The special elements of interest in this case was the irregularly acting heart (arrhythmia). What produced this condition in a heart that was apparently normal upon entering the hospital? Was it psychic? He certainly was worried about the examination and was of a highly neurotic type. A mere cystoscopy could not have produced it. It must have been some vagus irritation. Can it be that it was a reflex visceral irritation? The cardiac condition was not worse after the operation. As to the future course of this cardiac condition I had an electrocardiogram made. On February 25, 1922, Dr. Harold E. B. Pardee, who did this work, sent me the following report:

"The enclosed electrocardiogram of Mr. Podesta taken on February 23, 1922, shows a normal rhythm with a very slight sinus irregularity. There is a gradual lengthening of the interval between beats toward the end of leads two and three.

The ventricular waves show a sight degree of left ventricular predominance by the fact that S. in lead three is larger than R. in this lead, but the degree is so slight that it might be accounted for by the fact that his heart's apex is lifted up by the rather high position of the diaphragm which is found in chests of the type of his. There is no significant notching of the QRS group and the T wave is normal. There is nothing about these ventricular waves to suggest that there is any significant degree of myocardial abnormality.

This is in accord with the results of the examination of his heart by other methods. The apex beat is normal; the left border of cardiac dullness is in the IV space ten cm. to the left of the midline, which is not enlarged when the size of his chest is taken into consideration. The first sound at the apex is slightly prolonged but there are no murmurs here or elsewhere. His reaction to a test exercise (twenty swings of a ten pound dumbbell) was normal, there being only slight dyspnea and pulse acceleration which promptly passed off. There was no arrhythmia after exercise. Vagus pressure caused slight slowing of the heart rate. There is no evidence either here or in the electrocardiogram of any significant abnormality of the heart or circulatory system. I believe that the irregularity which was noted on previous examinations was of the extrasystolic type and that this may have arisen as a reflex from the renal disease, and later from the site of the operation. I do not believe that it means cardiac disease and it should pass off as the operation becomes more and more a thing of the past."

On December 17, 1921, the pathological department of the Columbus Hospital, in charge of Dr. G. Hohmann, had a section prepared from kidney submitted, showing extensive parenchymatous changes in various parts while in other parts the renal structure appeared normal. There was also associated with these a moderate hydronephrosis, which is most pronounced in the degenerated areas. The following report was made to me by Dr. G. Hohmann under date of February 20, 1922:

"The renal calculi submitted to me for examination show the following: All seem to be of about uniform composition; those analyzed consist mainly of calcium and magnesium oxalate, a large amount of uric acid, a small amount of phosphate ammonia and urea, a trace of carbonate."

The patient did very well, and made a satisfactory recovery. After a month's time he was perfectly well, the heart acting normally. His urinary output was normal. The x ray was very confusing and one could not even suspect the amount of real trouble in this case. From the results of functional tests, x rays or urinary findings, little could be ascertained. Why did not the x ray show all of these stones? There are many cases in the recent literature showing this failure of the x ray in diagnosis. How is one to know what is the best procedure to follow in a case of this kind? It is asserted that the stones being covered by purulent or turbid material will not show by x ray. In this case, even with the kidney outside of the body one could not judge. The consistency of the stones has much to do in throwing an x ray shadow. Different forms of calculi transmit the rays with varying degrees of facility. Calcium oxalate casts the densest shadow, urate stones come next, phosphates the least shadow. Pure uric acid casts no shadow. Usually these stones partake of two or more elements. Stone in one kidney may produce pain in opposite kidney. Renal stones are uncommon during childhood and old age.

As to diet, avoid dark meats, sugars, highly seasoned foods, rhubarb, tomatoes, asparagus, strawberries, champagne, malt liquors, but give freely of water.

The incision which will cause the least possible hemorrhage should be made in the line of separation of the vascular systems. Usually the vascular line lies close to Brodel's white line and one cm. away from it toward the posterior surface of the organ.

In the case described Dr. G. Hohmann was kind enough to have an x ray taken after these stones were placed within the kidney of a cadaver. They all showed fairly well. He also had an x ray taken of these stones through a board and they showed fairly well.

A normal urine does not exclude the possible existence of stone. Cabot reported many cases. Many cases of stone show normal renal function. Many never have hematuria. Pyelotomy is the operation of choice. There is no destruction of kidney or vessels and no important structures are hurt.

To sum up, in my own case there is a young man twenty-two years of age suffering with right abdominal pain, sent to the hospital, and operated upon for an appendicitis, symptoms persistent. Many cases are reported with such a history. He still continues with occasional attacks of pain. An x ray taken of the kidneys and found negative, urinary findings negative. The patient disappeared from observation and returned with severe symptoms in the right lumbar region, is cystoscoped, and almost goes into collapse on the table. There is grave doubt as to interpretation of the x ray findings. The doubtful looking shadow in the lower pole of the kidney gives a suspicion of the presence of more calculi in that kidney. Upon the exploration of the pelvis, the finding of a large branched stone, entirely different in shape and size from what I had been led to anticipate from the picture, made me feel more strongly than ever that the kidney was riddled with stones. A nephrotomy failed to reveal any. Owing to the causes mentioned, viz., a lacerated ureter, doubtful as to its repair, with leakage, possible hemorrhage, poor cardiac condition on the table, feeling all the time that the x ray was doubtful, finding a hydronephrotic cavity in the lower pole and still believing that there were many other stones, all these things make me decide to remove the kidney, especially knowing the left kidney to be normal, which proved justifiable, as the patient recovered completely and is now in excellent health and working steadily. His present urinary findings are perfectly normal.

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1904 Avenue I.

A Note Upon the Incidence of the Urochromogen Reaction of Weiss in a Series of 888 Examinations*

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Considering the multiplicity of the laboratory procedures now in use, it is not remarkable that the literature contains a number of what might be called short cuts devised, either to shorten the time required, or to lessen the complexity of the procedures to which they apply. A reaction concerning which several reports have recently been made is that known as the urochromogen reaction of Weiss and said to have a particular value in the prognosis, and, to some extent, in the diagnosis of tuberculosis.

Of particular interest in the evaluation of any laboratory procedure is the determination of its incidence in general, that is, not to what degree it occurs in the conditions for the detection of which it was devised, but to what extent it is found in other, nonrelated conditions; or, in other words, what is the measure of its specificity?

Obviously, the fewer the conditions other than tuberculosis in which this reaction appears the greater will be its specificity and the greater the confidence to be placed in its interpretation.

With this end in view it was decided to make this reaction a part of the routine uranalyses of these laboratories in a series of cases. As this is a general hospital in which cases of tuberculosis appear with relative infrequency and from which they are transferred to more suitable institutions as soon as may be, it was not possible to conduct a study of the reaction in connection with tuberculosis. To determine, however, the incidence of positive reactions in conditions other than tuberculosis, the test was made upon a series of 888 consecutive urines received in the laboratory and an endeavor made to elicit any history of interest in the cases reacting positively to the test. Unfortunately, the history was not always as complete as could be desired in this respect and certain of the cases noted as without history of tuberculosis must be accepted as signifying that, while nothing was noted on the chart, the result of a determined effort in this connection must remain unknown.

The mechanism of the reaction is unknown. The technic is extremely simple, but one reagent being required, a one to one thousand aqueous solution of potassium permanganate.

Although all of the urines tested were relatively fresh specimens, none being older than twenty-four hours, (twenty-four hour specimens), the color, reaction, turbidity, and general characteristics of the specimens appeared to have no influence on the test.

The technic is as follows:

Approximately five c. c. of urine is diluted in a test tube with three times the volume of water. After mixing, half the diluted urine is poured into another similar tube. One drop of one to a thousand potassium permanganate solution is then added to one tube and thoroughly mixed; the other tube serves as a control. The test is then allowed to stand for five minutes and then read.

In a negative test no color change appears, or, at most, a faint yellow or yellowish brown color which is transient. The positive reaction is evidenced by the appearance of a canary yellow color in the tube to which the permanganate has been added and which is relatively quite permanent, lasting for hours.

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*From the Laboratories of the Pittsburgh Hospital.

Using the technic as outlined above, in the 888 urines tested a positive reaction was encountered sixteen times, an incidence of 1.8 per cent.

The cases in which the reaction occurred are shown in the appended table giving the diagnosis and notes concerning the history.

It will be seen that in one case the sputum contained Bacillus tuberculosis; one patient had had enlarged cervical glands for a period of five years preceding admission and a family history embracing five deaths from tuberculosis; one had hemoptysis with a suspicious röntgenogram of the chest; and the remaining case, though without history, was reported by the radiologist, after an x ray, as suspicious of tuberculosis. The clinical condition was also decidedly suggestive.

Accepting these four cases as cases of tuberculosis, the incidence of positive reactions in conditions other than tuberculosis, tuberculosis not being proved, falls to 1.3 per cent.

It seems fair, then, to conclude that the reaction does not occur promiscuously and that the occurrence of a positive reaction justifies an exhaustive search for a positive tuberculous focus.

TABLE OF POSITIVE UROCHROMOGEN REACTIONS.

No.	*Diagnosis*	*Urochromogen test*	*Remarks*
1.	Lobar pneumonia.	+ +	Enlarged cervical glands for past 5 years; 4 sisters and 1 brother dead of tuberculosis.
2.	Tuberculosis, pulmonary.	+ +	Sputum positive for tubercle bacilli.
3.	Undetermined.	+	No history of tuberculosis; x ray of chest suspicious of tuberculosis; sputum: tubercle baccilli not found.
4.	Eclampsia.	+	No history of tuberculosis.
5.	Concussion.	+	No history of tuberculosis.
6.	Myocarditis.	+	No history of tuberculosis.
7.	Caesarean section.	+	No history of tuberculosis.
8.	Hemoptysis.	+	No history of tuberculosis; bacilli not found in sputum.
9.	Appendicitis, acute.	+	No history of tuberculosis.
10.	Pregnancy.	±	No history of tuberculosis.
11.	Pneumonia, lobar.	+	No history of tuberculosis.
12.	Fracture of tibia.	+	No history of tuberculosis.
13.	Pneumonia, lobar.	+	No history of tuberculosis.
14.	Fracture of skull.	+	No history of tuberculosis.
15.	Nephritis.	+	No history of tuberculosis.
16.	Diabetes insipidus.	+	No history of tuberculosis.

A New Method for the Quantitative Determination of Sugar in Urine

By J. BERGEN OGDEN, M.D.,
and JOHN M. CONNOLLY, M.D.,
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The purpose of this article is to describe a new method for the quantitative determination of sugar in the urine by means of a modified Pavy formula, and a unique technic for determining the amount of sugar in a small quantity of urine.

In 1879 Pavy (1) published a communication, which is as true today as it was then, in which he said:

"To be able to effect the quantitative determination of a body with accuracy and facility is an important matter looked at in relation to the study of its bearings. In the case of sugar there are no reliable means of precipitating and weighing it, either alone or in combination, and thus in the chemical estimation of this principle an indirect method has to be resorted to. The only property upon which dependence can be placed, for the purpose of chemical quantitative analysis, is its reducing action, under the influence of heat, upon certain metallic oxides, and that of copper is the one which general experience shows to answer best." The ammoniacal copper solution which he described at that time is well known, has been thoroughly tested, and has an extensive literature of its own.

Pavy thought he had demonstrated that "in the case of the ammoniated liquid, six atoms (*sic*) of oxide of copper are appropriated by one atom (*sic*) of sugar instead of five, as in that of Fehling's solution used in the ordinary way" (1). But Hehner (2) says that the sodium hydroxide must be present to the extent of 120 to 150 grams to the litre in Pavy's ammoniacal solution for accurate results on the basis of one to six. Long (3), who has made a careful study of the effect of varying the sodium hydroxide and the ammonium hydroxide concentration in Pavy's solution, says: "The oxidizing power varies greatly with the amount of ammonia present and is decreased with increase in the latter. Increase of fixed alkali adds to the oxidizing power." If this prove true we have a means of controlling the oxidizing power at will within certain limits.

Purdy (4) has modified Pavy's solution, as have Haines (5), Peska (6), and Kumagawa and Suto (7). Kinoshita (8) has made a study of the last named modification.

The following table showing the composition of some of these modified solutions is taken from Long's article:

	$CuSO_4.5H_2O$ grams	*NaOH grams*	*Rochelle salt grams*	*Glycerol c.c.*	*Ammonia 0.90 Sp. Gr. c.c.*	*Water q.s. ad c.c.*
Pavy	4.158	(7.20)	20.76	..	370	1,000
Hehner	4.502	15.6-19.5	22.49	..	370	1,000
Purdy	4.752	23.5 NOH (=16.8 NaOH)	..	38	350	1,000
Peska	6.927	10	34.50	..	135	1,000

The studies made of Pavy's solution all agree in tending to show that modifications in the sodium hydroxide and ammonium hydroxide strength have a decided influence upon the accuracy of the test.

We have devised a modification of Pavy's method, for the estimation of the sugar content of a small quantity of urine, which we have been using for the past four years with increasing satisfaction. The results obtained have been repeatedly checked by comparison with the Folin and Berglund (9) copper colorimetric method, by the Benedict and Osterberg (10) picric acid colorimetric method, and by well known titration processes. We have found it accurate, and possessing the advantage over the colorimetric and any other method of saving time and of being applicable to small quantities of urine—all of which are important factors in the laboratory of the clinician as well as in insurance work.

We have assumed that for the range of sugar percentages ordinarily found in urine, Pavy's original 6:1 copper sugar ratio is correct, provided that the quantities of sodium hydroxide and ammonium hydroxide are properly adjusted, and we believe that we have worked out the best adjustment of those quantities, both absolute and relative.

For the weight of crystallized copper sulphate used we have calculated thus:

Molecular weight of $CuO=79.57$.
Molecular weight of $C_6H_{12}O_6=180$.
Molecular weight of $CuSO_4.5H_2O=249.72$.
180 is equivalent to $6x79.57=477.42$.
$477.42 \div 180=2.652\ 1/3$.
$79.57:249.72::2.652\ 1/3:x$
$x=8.324$.

One gram of dextrose, therefore, corresponds to 8.324 grams of crystallized copper sulphate, when other factors are properly related. Our formula is:

Crystallized copper sulphate ($CuSO_4.5H_2O$)...	8.324	g.
Crystallized Rochelle salt ($NaKC_4H_4O_6$).....	40.8	g.
Sodium hydroxide ($NaOH$).................	29.2	g.
Ammonium hydroxide (NH_4OH) (Sp. gr. 0.9)	500	c.c.
Distilled water sufficient to make............	1000.	c.c.

As a result of our experience we believe that any change in these quantities will impair the accuracy of the test when used according to our method. It will be noted that we reverse the ordinary procedure thus greatly increasing the ease of manipulation.

METHOD.

Into a flask of convenient size[1] pipette accurately one c. c. of urine. Add about seventy c. c. of ammonium hydroxide solution, twenty-five per cent. of the concentrated, and insert a rubber stopper with two holes, one of which carries a glass tube through which the ammoniacal vapors are led off and the other carrying the tip of a burette which has previously been filled with the modified test solution. Boil the mixture in the flask for a moment to expel the air—then drop in the test solution—with constant boiling—until the first faint tinge of permanent blue is visible with the aid of a white background. The first portion of the reagent will immediately strike a blue color but this will disappear on continued boiling. The first permanent tinge of blue marks the endpoint. Each c. c. of the burette reading corresponds to one tenth per cent. of one per cent. sugar in the urine tested.

As an example, a sample of urine was examined for sugar by this method, and the burette reading showed 2.3 c. c. of the test solution used, corresponding to 0.23 per cent. of sugar. The Folin colorimetric method showed 0.22 per cent. on the same specimen.

In dealing with small quantities of sugar greater accuracy may be obtained by using two to five c. c. of urine in the flask and dividing the resulting burette reading by the number of c. c. used. The use of burettes such as those recommended by Folin and McEllroy (11) will result in still greater accuracy. One reason for the accuracy of the method lies in the fact that the urine need not be diluted to volume. Folin and McEllroy (11) say of their method: "The sugar titration described above . . . has been adapted to the use of undiluted urine. The objection to the traditional dilution of urine to a sugar concentration of 0.5 to one per cent. is that it cannot be properly made except on the basis of a preliminary sugar titration. (In the hands of medical students with a limited supply of measuring utensils the most frequent cause of gross errors in sugar determination is one or another error or carelessness in connection with the dilution.) Our sugar titration can, of course, also be made with sugar solutions containing only one half of one per cent. of sugar and can, therefore, be made with sugar urines diluted to such a sugar concentration." All these points apply with equal force to our method.

It will be noted that only the flask need be washed. The burette need not. Another valuable feature is the small quantity of urine used—this not only being of importance in cases where the quantity available is limited as, for instance, in life insurance work, but also having its influence in the direction of accuracy by introducing only minimal quantities of the disturbing substances contained in the urine.

With the usual Pavy technic the reagent in the flask soon has its ammonia content markedly diminished by the continued boiling—and the addition of a nonammoniacal urine solution. By our method every addition from the burette is fifty per cent. strong ammonia and the ammonia cannot all be boiled off—the conditions remain more nearly the same throughout the titration—and the endpoint is made very sharp and distinct.

We have tried clearing the urine with various reagents but the change in percentage is always small and in the second decimal place and we believe that the possible slight increase in accuracy is not worth the trouble for clinical work.

SUMMARY.

1. A new modification of Pavy's solution is proposed as an improvement on any formula heretofore published.

2. A new (reversed) method of titration is offered, more rapid and convenient in use than the usual procedure.

3. The claim is made that by this formula and method more accurate results can be obtained than by any other titration method at present available, and fully as accurate as those of the best colorimetric methods, the results of which it closely duplicates with less expenditure of time and labor.

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1 Madison Avenue.

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[1] (A 200 c.c. pyrex flask with short ring neck has proved very satisfactory in our hands, as the stopper may be inserted firmly without danger to the neck.)

A Review of Hereditary Syphilis of the Ear

By M. L. BREITSTEIN, M.D.,
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While intensive investigations of hereditary syphilitic affections of the ear, beginning with those of Hutchinson in 1863, have yielded gratifying progress in determining the etiology and clinical diagnosis, nevertheless the early diagnosis of the disease remains a problem.

In cases of congenital lues deafness is rarely an isolated symptom; more often it is associated with a keratitis parenchymatosa, or there may be typically malformed teeth, or all three conditions may be present at once. Hutchinson found deafness in fifteen per cent. of his cases of hereditary syphilis. Other authors give findings between twenty per cent. and thirty per cent.; Alexander gives twenty-five per cent, Baratoux thirty-three per cent. Cases showing all three of the triad combined are not common, nor do all three commonly come on at the same time. The interstitial keratitis usually long antedates the auditory disturbance. Alexander finds the fully developed triad in only two per cent. of his cases. While the complete triad is not often present, one seldom fails to find manifestations in the eye in the severer cases. Schlittler, in a study of thirty-three cases of congenital labyrinth syphilis, reports a finding of a manifest or healed keratitis in seventy-nine per cent. of his cases; thirty-three per cent. showed teeth changes, and the Hutchinson triad was found in 15.1 per cent.

The anamneses of these cases are somewhat characteristic and fall naturally into three groups.

1. Those suffering from severe subjective noises, but slight impairment of hearing.
2. Those who show in early childhood a slight limitation of hearing, which develops about the time of puberty, or seldom later than the twentieth year into high grade or complete deafness.
3. Those most severe cases in which the syphilitic infant has already undergone such changes in utero, that both parts of the inner ear are seriously affected in function. Not so frequent but exceedingly characteristic is a sudden onset of deafness without any vestibular symptoms; no disturbance of equilibrium nor spontaneous nystagmus. Such a syndrome places the diagnosis almost beyond question. To be sure, there can be observed in other diseases a sudden and complete loss of cochlear function, but hardly ever will one then fail to find disturbances in the vestibular apparatus. The prognosis in such cases is decidedly bad.

If we turn now to the objective clinical findings we note two outstanding features. First, the great diminution of the bone conduction with retention of normal or nearly normal air conduction, and secondly, abnormalities in the reflex irritability of the labyrinth.

Bone conduction is shortened in all affections of the inner ear; but in all conditions except syphilis the shortening of the air conduction keeps equal pace. In both hereditary and acquired lues the bone conduction is commonly shortened disproportionately. In the nonluetic with normal hearing some reduction of bone conduction occurs usually at about fifty years of age (Alexander). In the normally hearing luetic, however, this shortening of bone conduction very frequently takes place earlier. O. Beck and Wanner individually and independently found shortening of bone conduction in eighty per cent. of luetics with normal hearing. Wanner believes that shortening of the bone conduction with normal air conduction is due to an organic change in the bony structure of the skull. On the other hand, Beck believes it to be due to an increase in intracranial pressure resulting from generalized lues. In several cases he could demonstrate a disappearance of the shortened bone conduction during three to four hours after lumbar puncture with removal of five to six c. c. of spinal fluid.

The reflex irritability of the labyrinth in patients with acquired lues and still more often in hereditary lues, shows many variations. In many cases the irritability of the labyrinth to rotation is entirely destroyed while the response to caloric and galvanic stimulation is still active. Less often is there found a loss of caloric irritability with persistent active responses to rotation and galvanic stimulation. Only isolated cases of negative galvanic stimulation are reported in luetics. It is noteworthy that the experimentally produced nystagmus of the hereditary luetic is hardly ever accompanied by dizziness. In some luetics it is possible to induce nystagmus by certain mechanical stimuli which do not normally cause this reaction. Though no labyrinth fistula was present, and though drum and middle ear were normal, Hennebert, Barany, Alexander, and Beck have reported a production of nystagmus by compression or aspiration, or by both. According to Alexander these are almost without exception cases of hereditary lues. The compression or aspiration nystagmus does not remain constant in hereditary lues but often disappears after several weeks, usually to recur later. Sometimes after one or two demonstrations it is seen no more. These latter cases are usually advanced labyrinthine affections with great diminution of hearing.

J. W. Downey reports on the examination of twenty-eight cases of syphilitic ear affections; we can accept his conclusions that: "The most characteristic reaction of syphilitic internal ear disease is a lowering and confusion of all the responses; this may vary from the totally dead labyrinth giving no responses, to the cases showing all the normal reactions reduced in degree." He was able to verify the shortened bone conduction in every case. Five of Downey's cases were hereditary luetics and four of these showed interstitial keratitis. These five cases showed practically all the major varieties of syphilitic eighth nerve involvement.

In reference to the relationship of the caloric, the rotation, and the galvanic reaction in hereditary syphilis, the report of O. Beck at the German Otological Congress in Nürnberg in 1921 is of interest. He reports that while the responses to the caloric and rotation stimuli were most variable, all of his cases had this one thing in common: The galvanic reaction was not only always obtainable, but the galvanic reaction, when obtained, always gave normal values. From these observations Beck concluded that the vestibular nerve was normally irritable and that the primary seat of disease in hereditary syphilis is not in the nerve but in the lymphokinetic apparatus.

Something should be said here about galvanic nystagmus. The viewpoints concerning the mechanism, particularly the localization of the origin of galvanic nystagmus, are not entirely in accord. While the older investigators, Ewald, Brewer, Jensen, referred the observations following galvanization particularly to the cerebellum, the more modern writers seem to agree that the galvanic stimulus affects the vestibular region itself. The Viennese investigators have always held the opinion that the galvanic current affects the nervous element of the vestibule directly. Barany thought that with the catalectrotonus, there was brought about an increase in the conductivity and through the analectrotonus a decrease in the conductivity of the vestibular nerve, and that in this manner a change in the direction of the nystagmus could be explained.

Bruenings thought the galvanic nystagmus was due to a cataphoresis which produced a movement of the endolymph. However, there are to be found in the literature numerous proofs that after destruction of the labyrinth, the galvanic reaction is at times still obtainable.

Brewer and Lewandowsky concluded from their experiments on monkeys, cats, and dogs, that after bilateral destruction of the endorgans the galvanic reaction could be obtained, only one had to use a stronger current. They presumed the place of origin to be the central nervous system, probably the nuclei of the medulla. Kubo concluded from his experiments that the galvanic stimulus affected the nerve directly.

Since a reaction is obtainable after destruction of the semicircular canals the galvanic reaction can be produced only from the nervous element. The viewpoint of O. Beck would therefore seem warranted: The primary location of damage in hereditary aural lues is to be placed in the lymphokinetic apparatus and it can not be regarded as a nerve affection. Neumann also holds responsible lues of the connective tissue for the ear symptoms of hereditary syphilis.

O. Beck endeavored to find an explanation of the great variations in aural lues by studying the time interval between the infection of the mother and the birth of the child, and further by studying more exactly the antiluetic treatment which the mother received before the birth of the child. In three families he was able to obtain exact information in these particulars. In the first case the mother knew nothing of her infection; she had received no antiluetic treatment before the birth of the first child. In both of the other cases there were reported regular courses of mercury before the first conception. No relation, however, could be found between the treatment of the mother and the severity of the infection in the children. Likewise it can not be stated that the later born children, that is born a longer time after the primary infection of the mother, tend to show less severe ear involvement.

Our present knowledge of the pathology of the leutic process in the ear is very unsatisfactory. All of the observations give us information concerning the ear changes in luetics rather than characteristic luetic processes. To be sure, changes of a definitely specific nature have been observed; among these may be mentioned: 1. Sclerosis of the eustachian orifices (probably a manifestation of secondary lues in the nasopharynx); 2, true papular syphilides of the drum; 3, periostitis and ostitis of the mastoid with gumma formation; and 4, gumma of the medial antral wall (Manasse).

Many careful microscopic examinations of the mastoid bones of luetic foetus and luetic infants reported by Walker Downie, Baratoux, Habermann, Meyer, Hofer, and others, afford in no single case changes which can be regarded as characteristically specific. The frequent purulent middle ear affections show the same pathological changes as those found in nonsyphilitic children and the middle ear affections occurring in the later life of the congenital luetics do not show any differentiating findings as distinguished from like affections in nonluetics (Manasse). It is interesting to note that Manasse was able to find in the middle ear of an eight months old fetus a great number of Spirochetæ pallidæ and yet there was a striking deficiency of "luetic tissue changes" on microscopical examination.

In a recent publication O. Beck and Schacherl report the spinal fluid findings in hereditary lues of the nervous system and in cases of hereditary luetic inner ear manifestations. These cases are divided into three groups: a. Patients with normal hearing, but signs of involvement of the nervous system. b. Patients with marked bilateral deafness with severely damaged labyrinths who gave negative findings in the central nervous system. c. Patients who showed involvement both of the ear and the central nervous system.

They conclude that the hereditary luetic acusticus affections are to be differentiated from the greater group of hereditary luetic affections of the central nervous system. Whereas the spinal fluid of the hereditary luetic affection of the central nervous system almost always shows evidence of an active syphilitic process, this was not true in the hereditary luetic acusticus affections. Not only was the blood Wassermann of these cases negative, but the majority gave likewise a negative spinal fluid Wassermann. Those patients who showed involvement of both the ear and the central nervous system gave findings similar to those showing only nervous system involvement. The authors emphasize that hereditary syphilis of the ear is an affection of the connective tissue and is not primarily a nerve tissue affection.

Schlittler strikes the only cheerful note in the rather gloomy chapter of therapy in congenital lues of the ear. Practically all other investigators report discouraging results with the usual antiluetic measures. Schlittler reports the result of salvarsan treatment in forty-three cases in which the hearing defect had existed for one or more years. Of these thirty-five per cent. showed an improvement in hearing. In fifty-one per cent. the hearing remained unaltered and in fourteen per cent. the hearing became worse. The author says, however, there was no apparent relation between the diminution in hearing and the salvarsan treatment. Of sixteen cases in which the salvarsan treatment was begun shortly after the occurrence of the disturbance in hearing seventy-five per cent. showed improvement of hearing; 12.5 per cent. remained unimproved; and in 12.5 per cent. the hearing became worse.

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Full list of references will appear in the author's reprints.

A New Cystoscopic Table*

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The need for a combined cystoscopic and x ray table has long been felt by urologists. The fact that so many tables have been proposed is evidence that none of them has been entirely satisfactory. The aim we have in mind in constructing a new one has been to retain the good features of the best tables and reduce the expense by making the mechanism as simple as possible.

The frame is constructed of one and a quarter inch steel tubing finished in aluminum bronze with the legs spread in order to make it more firm and to add to its strength. It is placed high, in order to add to the comfort of the operator and to increase the facility of instrumental manipulation. The fulcrum is forty inches from the floor. The proximal legs or those at the foot of the table are provided with rubber feet which rest on the floor; the distal legs or those at the head of the table are provided with six inch rubber tired wheels. The construction allows the table to be wheeled about easily by slightly lifting the proximal legs. When these are resting on the floor the table remains fixed in position.

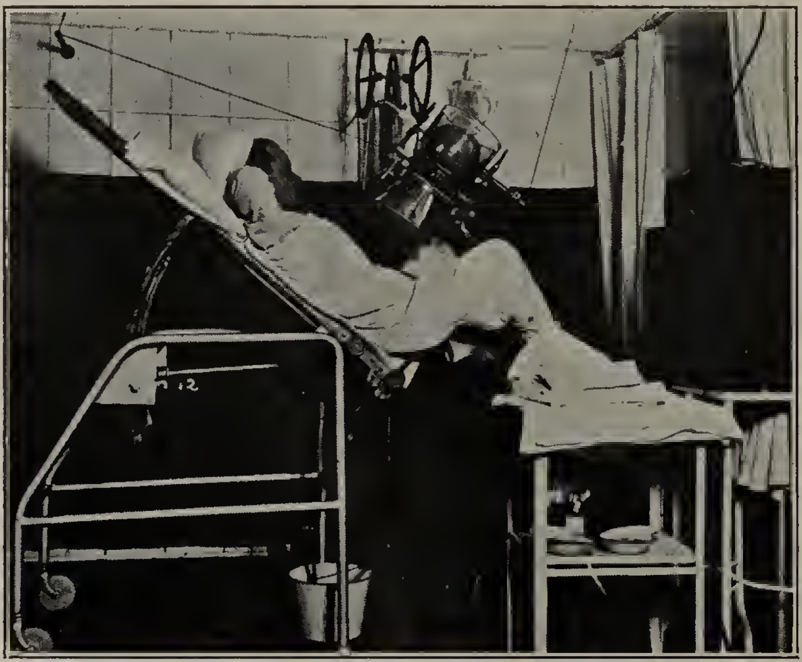

Fig. 1.—Cystoscopic table showing its use in one of the many position with the x ray apparatus in place for radiographic work.

The top of the table is flat without a break in its surface and is made of monel metal which does not rust and which is not affected by acids, etc. It is sufficiently long for the tallest man to be able to rest his head upon it. There is a split in it at the foot, wide enough to allow fluids to escape into a conical shaped reservoir made of monel metal, which slides backward and forward and which may be fixed into position by means of a thumb screw. Near the front on one side of the table, is a control wheel within easy reach of the operator, which easily and quickly puts the table in the position desired by the operator; this control raises or lowers the head end, thus placing the patient at any desired angle.

The patient's legs are supported by improved Bierhoff knee rests fitting on square shafts, the tops of which are turned 30 degrees outward. These rests move backward and forward but cannot rotate. They move up and down and also may be shifted from a position even with the top of the table to a very acute angle by withdrawing a spring catch which fits into a series of holes, drilled into a metal disk.

There is no x ray tube stand attached, but use can be made of one of the many excellent ones already on the market and with which practically every x ray department, even in the smallest hospital, is equipped.

The table may be finished in white enamel instead of aluminum bronze, but the latter is preferable for the reason that the enamel is prone to crack and become discolored from the fluids which are often spilled on a cystoscopic table.

No x ray plate holder is attached. The plates are laid upon the top of the table and just under the patient's body. In this manner the plate is placed exactly where it is desired and the flat top of the table eliminates the possibility of the plate being cracked.

CONCLUSIONS.

This table is comfortable for the patient, simple in design, easy to manipulate, and can be used for any purpose that any of the more costly ones are used for. It is, in addition, graceful in appearance, and last and most important, its cost is extremely low for the advantages offered.

32 East Sixty-fifth Street.

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Tabetic Kidneys Diagnosed as Tuberculous*

By HOWARD S. JECK, M.D., F.A.C.S.,
New York.

While making rounds on the Urological Service at Bellevue Hospital recently my attention was directed to a patient who was crying out as if in great pain. He was an Italian, twenty-eight years of age, who had been admitted eight or ten days previous with the chief complaint of pain in the right loin. The history of this patient on admission (none too accurate because it was obtained through a poor interpreter) was briefly as follows:

Pain in right loin of twenty-two days' duration, not colicky and did not radiate; vomiting daily for two weeks; no previous attack of the pain or vomiting. He further gave a history of dysuria of two years' duration, having to pass urine about every two hours by day, and six or seven times at night. He contracted gonorrhea one month before admission, and still showed a urethral discharge at this time. No history of hematuria. His family and past histories as obtained on admission were unimportant.

The physical examination, made shortly after admission, was completely negative except for a very dry tongue and palpable kidneys; the lower poles only could be felt. Cystoscopic examination, however, revealed a diffuse cystitis and near the place where the right ureteral mouth was normally located there was a diverticulum whose orifice was about one and a half cm. in diameter. A ureteral catheter could be introduced for three cm. before it began to buckle. There were also marked trabeculations of the fundus and vault of the bladder. Neither ureteral orifice could be seen and indigocarmin injected intravenously did not appear at all during twenty minutes' observation. X ray examination was negative for stone. His urine, which grossly was pale, watery and very cloudy, had a specific gravity of 1.010, one-eighth per cent. albumin and showed a heavy flocculent sediment on standing; the latter under the microscope was pus.

Phenolsulphonephthalein, injected intramuscularly, did not appear at all in the urine collected for two hours. On account of the pale urine loaded with pus, the marked frequency, the lack of kidney function, and the fact that the patient was an Italian, we all agreed that a diagnosis of bilateral renal tuberculosis was the one that fitted in with the picture best, this despite the fact that examination of the urine for tubercle bacilli was negative. The patient's condition did not warrant any further diagnostic measures, such as pyelography, and on the strength of our original diagnosis there seemed to be nothing to do except to keep him comfortable and await the inevitable.

I had observed this patient several times in making rounds, but had never noticed that he suffered any pain. On this particular occasion, however, a glance sufficed to show that his suffering was intense and on inquiry as to the location of the pain he indicated in a general way the abdominal and kidney regions. In my experience with patients suffering from renal tuberculosis I had never noted any particular discomfort on their part except in connection with the act of urination—certainly I had never heard one complain of pain or at least severe pain in the kidney region. I was, therefore, more than ordinarily interested in this man's suffering, and fortunately at the moment was able to enlist the services of an intelligent male nurse as an interpreter. I requested the nurse to try to get the patient to tell me the exact location of his pain and its nature. Immediately came the response that the pain was very intense, that the patient felt as if *a rope were tied very tightly about his waist.* This reply was obtained voluntarily and without the aid of any leading questions whatever, as up to that moment the question of syphilis had not entered into the diagnosis. Once having got this lead, however, I obtained through the nurse interpreter a definite syphilitic history, to the effect that the patient had a lesion on the penis in 1919, followed by a rash eight weeks later. At the same time he had a sore throat, and enlargement of the postcervical chain of glands. This occurred while he was a soldier in the Italian army, and as near as we could make out his entire treatment had consisted of about thirty-five injections of mercury. He had evidently had no salvarsan. I at once made a rather hurried examination of his reflexes and found that the pupils were small and reacted sluggishly, if at all; that his knee jerks were hyperactive; the Achilles' reflexes negative. I then tapped his cord, and withdrew a few cubic centimetres of clear spinal fluid. To my surprise an immediate cell count showed no increase in cells, and a Wassermann done later was negative. However, there was a definite increase in globulin.

Morphine was the only thing that would control the patient's pain. He had two or three attacks similar to the one I have described, during the next few days, and died about four days later. Fortunately, we were able to obtain an autopsy which bore out the eleventh hour diagnosis of syphilis and disproved the presence of tuberculosis.

In brief, the salient features from a urological point of view, as shown by the autopsy, were as follows: 1. Bilateral pyonephrotic kidneys with multiple abscesses in the cortex; cloudy swelling. 2. Chronic suppurative and productive ureteritis. 3. Chronic cystitis. Marked trabeculation and diverticulation of bladder. 4. Chronic interstitial orchitis. There were no gross or microscopical lesions of tuberculosis of the kidneys or elsewhere in the genitourinary tract. There was, however, evidence of an obsolete tuberculosis of the upper lobe of one lung.

Because of the orchitis and marked trabeculations of the bladder, without the presence of tuberculosis, Dr. Douglas Symmers, director of the Pathological

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*Case report presented before the Section in Genitourinary Surgery, New York Academy of Medicine, May 17, 1922.

Department of Bellevue, felt that we were justified in assuming that the bladder was that of a tabetic patient, and that the bilateral pyonephrosis was due to back pressure and subsequent renal infection. The spinal cord was removed, but is still in the process of fixation and staining for future microscopical examination. Neurologists tell us that in some case of cerebrospinal lues the degeneration of the cord is wholly parenchymatous and there is no meningeal involvement. This doubtless explains the lack of more definite findings in the cerebrospinal fluid of this patient.

Genitourinary Case Histories*

By JOHN STURDIVANT READ,
Brooklyn.

HYDROPYONEPHROSIS DUE TO CALCULI, COMPLICATED BY A RESULTING FECAL FISTULA.

Case I.—Capt. R. B., English, aged thirty-nine. The family history was negative except for one uncle who died of tuberculosis. The patient's general health had been excellent until six years previous to my seeing him, which was in July, 1915. At that time (1909) there was an attack of what was diagnosed as malaria. Chills, fever, and perspiration occurred and the following day a small calculus was passed. For two months following this there were many such attacks associated with severe pain in the left thigh. This was thought to be due to sciatica. During this period there were no symptoms referable to the kidney except the one calculus passed. All treatment was antimalarial. The condition of the urine was not known. His family physician, in a small English town, did not regard it as significant. Recovery seemingly took place and he was free from symptoms for four months. Then there was severe headache and left sciatica of sudden onset. This attack lasted four days; it ceased abruptly for two days and then there occurred a dull aching pain in the left renal region with the appearance of a tumor which he himself could palpate. This increased in size, gradually extending downwards. An incision was made and three pints of pusy urine were evacuated. Examination showed an operative scar, four inches long, over the middle third of the left ureter. Following this operation he has been in active command of his ship, an occasional painless hematuria being the only abnormal condition he had noticed. Five years later, in June, 1915, he was admitted to medical service of the Long Island College Hospital, complaining of pains in the left side, back, and joints. These increased in severity for four days, an abscess developed in the site of the old operative scar which ruptured during the night.

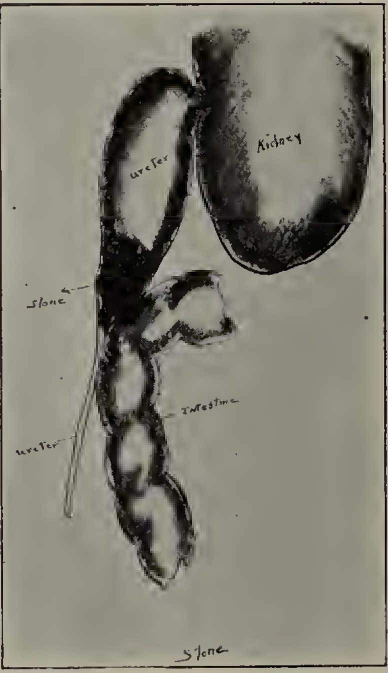

Fig. 1.—Schematic representation of renal calculus ulcerating into the large intestine.

When first seen by me, the following day, there was a fecal fistula (Fig. 1). Radiographs showed nothing definitely. (A pus kidney with a thickened capsule and soft stones.) Cystoscopy showed a normal bladder. The right urine was normal. The left urine contained pus, feces, Bacillus coli in large number and many other varieties of bacteria in large numbers. The urea showed three grains to ounce. Bismuth paste injected into fistula showed a negative radiograph. In July, 1915, an operation consisting of the usual incision over kidney, with the removal of the twelfth rib. A large pus kidney in which were three soft stones, size of a robin's egg, was removed. One of these stones was wedged into the ureter about two inches below the renal pelvis. It seemed that this had been the site of a leakage of urine, for there was a large mass of surrounding inflammatory tissue, which was very dense. In this was held fast a portion of the intestine. The patient's condition was poor; any pulls on the kidney pedicle increased the risk of enlarging the hole in the gut so the ureter was tied off rapidly and two clamps were placed on the vessels. The clamps were removed in seventy-two hours. Convalescence was prolonged but uneventful. A fecal fistula persisted. After six weeks an attempted repair was unsuccesssful. The surgeon found it impossible to free the gut enough to make a plastic closure. Nine weeks after this the fistula closed. The patient went to England. Four weeks after his arrival the fistula reopened. It finally closed under injections of bismuth paste. (Following the suggestion of Sir Berkeley Moynihan.) In September, 1916, he took command of his ship. He was submarined and taken prisoner to Germany. There was no further information. This case is of interest as an example of Nature's attempt to pass a kidney calculus through the intestine.

PAPILLARY CARCINOMA OF KIDNEY.

Case II.—D. C., male, Irish, aged fifty-three. His mother had died from carcinoma of breast. The patient's general health was excellent; habits good. The only symptom was a dull aching pain in right renal region for past two years. In September, 1916, an attack of painless hematuria occurred. He consulted four physicians from whom he received internal medication. The blood in the urine continued and he was in a hospital in New York where rest and ice bags to right kidney region were applied. The hematuria ceased on the fourteenth day. It appeared again in eight weeks. He was first seen by me in February, 1917, five months after the first attack of hematuria and two and a half years after he noticed the first symptom, which was a dull pain in the back. Cystoscopy showed bladder normal, bright red blood issuing in jets from right ureteral orifice. (Left kidney orifice normal and function tests normal.) Radiographs showed both kidneys to appear normal; no calculi, pyelograms were not made.

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*Read before the Section in Genitourinary Surgery of the New York Academy of Medicine, April 19, 1922.

A diagnosis of right renal tumor was made. Nephrectomy revealed a small tumor located in the lower pole and involving the pelvis. The convalescence was uneventful. The patient returned to work, as a porter, in six weeks. His general health remained excellent. There were no symptoms for two years when an attack of painless hematuria occurred. In April, 1919, cystoscopy showed a small tumor at the right ureteral orifice. A piece of this tumor, secured through the cystoscope, was too small for diagnosis. Fulguration controlled the hemorrhage. Cystoscopy was done once a month. The tumor increased in size slowly. Fulguration controlled the hemorrhage for periods of three weeks. There was never seen any hematuria from the left ureteral orifice. His general health was excellent. There was no pain. In September, 1919, two and a half years after the nephrectomy, the patient reported a spitting of blood. This hemoptysis continued. Radiographs showed metastasis to both lungs. The patient died in July, 1920, three years and four months after operation.

174 Clinton Street.

A Case of Chancre on the Penis at the Age of Seventy-one, Apparently With No History of Sexual Contact

By ALBERT M. CRANCE, M.D.,
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The review of the literature of primary syphilis in senility reveals but two cases beyond the age of seventy. The patient in Wile's (1) case was aged seventy-nine. Wollenberg (2) reported a case in a man aged eighty-one. Both of these cases, however, gave a definite history of coitus. My case is of further interest because there was apparently no sexual contact.

Case.—Male, aged seventy-one years, eleven months, presented on June 16, 1922, a painless sore, about the size of a dime, slightly to the left of the frenulum. It had been growing slowly for nearly six weeks, and had not responded to treatment by various ointments which had been prescribed to him previously. The lesion gave the typical appearance of a chancre, with hard, indurated border. There was considerable edema in the surrounding tissue.

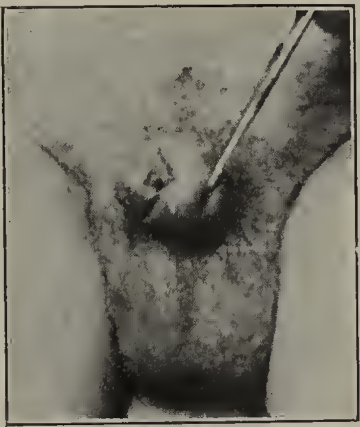

Fig. 1.—Photograph of patient showing the appearance of the chancre and edema about the prepuce.

The general physical examination showed a poorly nourished man, about six feet in height, with practically all the signs of paralysis agitans. The patient stated that he had had this condition for about five years. There was an absence of teeth. The throat was negative, showing no secondary signs. The skin of the chest and abdomen showed a questionable specific maculopapular rash, scattered and of mild degree.

Examination for the Spirocheta pallida was deferred until the following day, owing to the presence of calomel ointment on the sore. The lesion was washed with normal saline solution, and a wet dressing of the solution applied. June 17, 1922, the Spirocheta pallida were demonstrated. A Wassermann taken the same day returned four plus. Four tenths gms. of arsphenamine were given intravenously, and repeated every five days. The lesion disappeared almost entirely after the second treatment, and now, after five administrations, was entirely gone. Treatment was continued.

COMMENT.

On several occasions the patient had denied having had sexual intercourse within the past two years. He stated that he recently stayed at a rooming house in which there were fifteen other men. He believed now that one of the men had a genital sore, and was using an ointment for treatment. It is possible that he was infected through the use of the toilet. However, the writer is still skeptical concerning such a history. The case is of interest because it is rare to have primary syphilis in senility, also that there is the possibility of its being a genital chancre not transmitted through sexual contact.

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14-18 Schnirel Building.

Editorial Articles

FREEDOM.

A new and better medicine has come into being; no more study, no more hard work, no more sympathetic visits with patients, no more operations, no more doubt as to diagnosis, no more postmortems. . . . No longer shall we need to study symptoms, nor physical signs, nor "nothing"; no longer shall we need even to see the patients. All of these things have their advantages. Just think of the advantages of avoiding even seeing one's patients! There need be no longer that feeling of guilt when the payments for "services rendered" are timidly asked for.

The greatest advantage to be gained, however, is from the additional time the physician will have to disport himself in such occupations as he may best see fit. There should be more time for play—poker or golf are merely suggestions. Profit and pleasure may be merged by filling in the long hours by the operation of a series of retorts which have a tendency, when properly manipulated, to produce a rare decoction of high potency and low specific gravity. At last the day of emancipation for the physician is drawing near. No longer a slave to office hours and night calls. Freedom, that magic state we all prize so highly, is at last in sight. The physician is finally coming to his own.

For these many and sundry benefits which have come to the venerated science of Æsculapius and Hippocrates we have to thank a medical man—not medicine man, but medical man. This modest savant, who does not even burden the medical press with technicalities of his intricate modalities, comes from the city on the Golden Gate, San Francisco, and his name is Abrams. Only a few of his miracles have trickled through that almost impregnable barrier, the daily press. So we can only surmise a few of the wonders he has created. Only the simpler ones have been revealed. A drop of blood, the rumbling machine (perhaps it only sputters), and presto! we have revealed the life history of the patient, age, sex, paternity, occupation, weight, height, complexion, talents, loves, hobbies, vices, diseases, legitimacy, horoscope, number and sex of children (if any), political and religious faiths, endocrine status, disposition, criminal tendencies—in fact, the sum total of his deepest, most miserable self stands revealed by the magical implements of this wizard from the West.

Of course there may be here and there a fanatic who will not consent to the giving of that single drop of blood which will enable the saving of body and soul, but these obstinate ones can always be shunted over to the chiropractors who surely will not be willing to cast aside their years of labor for a mere inanimate machine. The medical men are more broad minded and have many other, more lucrative and enjoyable occupations calling to them; therefore, we extend to Abrams and his apparatus our most profound gratitude.

The only pang of regret that can come to the older man of medicine will be the one in regard to the writing of medical topics. No more books, no more journals, and also no more editorials. Here, at least, every follower of the tribe of medicine who longs to tell the world how it should be done will give up this phase of the medical profession with a pang of regret. Who knows? this may, after all, be the last editorial.

PRIMARY PERINEPHRITIC PHLEGMON.

Primary perinephritic phlegmon develops without any clinically appreciable renal lesion in subjects appearing to be in good health. This definition has the advantage of making a distinction so necessary, between suppurative inflammatory processes which develop as an initial lesion in the renal fossa and purulent collections of the lumbar region which invade this fossa and are the result of purulent pleurisy, cholecystitis, gastric and duodenal ulcers, pancreatitis and appendicitis. The term perinephritic phlegmon should be reserved for pus collections which develop as a primary process in the renal fossa around the kidney. Thus understood and defined perinephritic phlegmons can be divided into two principal classes; 1. Symptomatic perinephritic phlegmon resulting from chronic renal lesions—particularly lithiasis and tuberculosis—or arising as a complication during the evolution of general diseases. 2. Primary perinephritic phlegmon occurring without any known cause, but whose pathogenesis has been enlightened by recent researches.

Trousseau long since studied the etiology of perinephritic phlegmon and attributed it to causes which today are regarded as simply predisposing. He was ignorant of the sources of infection and the various routes it followed, but at present it is known that this complication results from various forms of medical and surgical infections. The angina, bronchopneumonia, and gastroenteritis often have some little share in the causation of this process. From the surgical viewpoint the most benign lesions are to be incriminated, which will have often disappeared at the time of the development of the perirenal complication, from whence arises the necessity of making a careful case history. One will frequently obtain the history of a former boil, carbuncle, infected wound, abscess of the anus, eczema, abscess of the sacrum, otitis media, and other conditions. A well directed examination of the patient will invariably lead to the discovery of the point of entrance of the infection. From the viewpoint of the bacteria, it is above all the staphylococcus that is active, but the colon bacillus, streptococcus, pneumococcus are occasionally factors.

From the pathogenic viewpoint the infection takes place by way of the blood. It is now known that angina, gastroenteritis, and peripheral suppurating processes give rise to the entrance of bacteria into the circulation and that these bacteriemias are usually made manifest by attenuated phenomena, such as slight fever, insomnia, mild discomfort and coated tongue. The bacteria having invaded the circulation reach the perirenal fat and become localized there. The reason for this is not difficult to understand. Perinephritis usually results from intermediary renal lesions. During a bacteriemia the bacteria accumulate in the cortical zone of the kidney because of the important mass of blood which flows through the organ and on account of the barrier offered to their passage by the renal filter. This stasis may not result in any lesion to the kidney but it may also give rise to slight lesions, nephritis or miliary cortical abscesses, or more serious lesions, such as high grade nephritis or large abscesses. The lesions are usually unilateral. No matter what may be their extent, the bacteria thus held in check reach the perirenal fat capsule by effraction or by the blood or lymphatics, also by progressive extension. and result in the formation of an abscess in this fat which cannot resist the infection. Exceptionally, the infection may result from a septic embolus. In reality, a perinephritic phlegmon is due to some renal process, whether it be chronic and of long standing, or to a mild or severe bacteriemia.

The diagnosis of primary perinephritic phlegmon has been the cause of numerous mistakes; nevertheless there is great need of recognizing it as early as possible, not only to avoid long suffering for the patient, but to prevent the vast collection from extending to other neighboring viscera. The onset of the process may be sudden and ushered in by a chill and pain in the lumbar region; there is fever, prostration, insomnia and coated tongue. In other cases the clinical syndrome is more obscure, less dramatic and with a slow evolution. However this may be, the attention of the physician should be attracted by the presence of a deepseated, dull pain in the lumbar region. A precise indication is the traces of a localized infection undergoing its evolution or recently cured. The diagnosis will be made after noting the following symptoms: In the first place, there is rigidity of the muscles of the costovertebral angle external to the sacrolumbar mass; this sign is of the highest import; secondly, an exquisite pain produced by strong pressure at the apex of the angle formed by the twelfth rib with sacrolumbar mass; and lastly, retraction of the thigh, from contraction of the psoas, a fairly frequent symptom. The degree of leucocytosis should also be taken into consideration. Examination of the separated urines is of utmost necessity, as it will reveal a functional deficiency and bacteriemia on the affected side, the diagnosis being thus settled.

URIC ACID IN FICTION

Disease bulks somewhat largely in fiction, that is, it is used freely by the novelist to point a moral or adorn a tale, or to add a melancholy and pathetic interest to a story and to get rid of an inconvenient character who must be killed in some way or another. Of all diseases with which fiction abounds, none is brought in more frequently than gout and rheumatism, the uric acid maladies par excellence. While uric acid to excess is painful in fact, it is not without its compensations in fiction, and may be classed under the head of two great divisions, rheumatism and gout. Many of the heavy fathers of fiction have owed their bad temper to the latter disease, while the aches and pains of which the ancient crones complain may be attributed in the vast majority of instances to the former. Dickens has more than once made reference to the proneness on the part of aged and poor females to suffer from aches and pains in the joints, pointing out through the mouth of one of his characters in *Barnaby Rudge,* that such women if they were in a more elevated station of society would be gouty, but being but hewers of wood and drawers of water they are rheumatic. Gout is an aristocratic disease, or rather one at least of polite society. The great Dr. Samuel Johnson suffered from excess of uric acid, and in a frenzy of poetical, or perhaps arthritic fervor, was guilty of the following lines:

> Unhappy, whom to beds of pain
> Arthritick tyranny consigns.

The two dukes of Omnium suffered from gout and the Marquis of Ringwood in Thackeray's *Philip* was a martyr to gout, indeed it caused his death. Lord Ringwood, however, when attacked by paroxysms of gout did not display the martyr's spirit, but was exceedingly violent both in language and demeanor. Sir Thomas de Boots, K. C. B., in the *Newcomes* was not unacquainted with the twinges of gout, and there is little doubt that Jos.

Sedley in *Vanity Fair* was troubled with the selfsame pains. Major Pendennis, that admirable society stoic, was afflicted with both gout and rheumatism, but, in the cause of fashion and his nephew, endured his agony with philosophical fortitude. Scott's Sir Robert Redgauntlet was in the same case. However, although too great indulgence in port was usually the cause of gout, persons in a humble sphere of life could reach the gouty eminence by means of rum, witness Bill Barley in Dickens's *Great Expectations.* But enough has been said to show that uric acid, or rather its effects, is a favorite theme of the novelist. But while uric acid and its sequelæ are still with us, the kind of gout depicted by the novelists of forty or fifty years ,or more ago has almost disappeared. Sad to relate, the other great division of uric acid in fiction, rheumatism, still holds its own.

VENEREAL DISEASES IN COLLEGES.

With the purpose of obtaining from college presidents their opinions on the prevailing attitudes and practices of college men in sex matters, the United States Bureau of Education and the Public Health Service recently sent to nearly one hundred college and university executives the followings questions: "In your experience does it seem that the student's attitude toward sexual promiscuity, or his habits and practices have undergone any considerable change during the past fifteen years? If so, what is the direction of the change and to what forces do you attribute it?" It will be noted that these questions make no reference to venereal diseases. A total of sixty-five replies was received, discussing widely varying problems of conduct from as many points of view. On one topic alone—that of venereal diseases—there was unanimity of opinion. Practically forty per cent. of the replies made specific mention of this subject, showing the importance attached to them as a problem of conduct by the presidents replying.

The consensus of opinion was that the college student of today realizes as never before the dangers and risks of promiscuous sex relations, and, consequently, is more circumspect in his conduct and more enlightened in his attitude. This change, most of the replies frankly conceded, is probably due not so much to a higher "sense of morality," but to certain forces influencing the life of the young man at college, among them education, both popular and academic, in matters of health; a more active concern on the part of the college in the physical welfare of its students; improvement in environmental factors, such as the elimination of the saloon and the suppression of prostitution; and, last, the influence of coeducation upon the socalled atmosphere of the college. A number of the presidents confessed to being more or less at a loss to specify the facts upon which their opinions were based, but the most encouraging criterion and the one most frequently quoted was the evident decline of venereal infection among this particular group. That this decline is a fact was shown by quotations from the sickness records or from the health officers of the colleges replying. Not one president expressed himself to the contrary. A number of these opinions are quoted and commented upon in an article giving the results of the brief questionnaire in *Public Health Reports* for August 4th. The conclusion is that "whether college students as a group have always been superior in this regard to the general community, the present rise in the college standard being simply a reflection of higher community standards, or whether the college group as compared with the community actually occupies a relatively higher position today than a decade or more ago, are questions which, if answered, would throw considerable light upon the effectiveness of the movements for venereal disease control. But leaving aside the refinements which these questions suggest, there is still the hopeful sign that college students are observing more and more the principles of hygienic living. . . . Health education is undoubtedly having a telling effect. College students are avoiding, more and more, the contacts that menace health and undermine virility. This, in the light of what the college presidents say, appears reasonably certain."

SYPHILITIC CHANCRE OF THE PALPEBRAL CONJUNCTIVA.

The initial lesion of syphilis developing in the palpebral conjunctiva occurs about as often on the upper as on the lower lid. In the cases collected by Kauplianský [*Thesis,* Paris, 1913] the chancre was on the upper lid in twenty-one cases and in twenty others on the lower lid. The lesion is usually single, but occasionally two are present, one on the conjunctiva, the other on the skin of the eyelid. In a case reported by Gelle there was a chancre on the palpebral conjunctiva and one on the pituitary mucosa. Frequently the chancre on the mucous surface of the lid will develop towards the corresponding cul de sac, and inversely, one in the cul de sac will invade the internal surface of the eyelid. In one reported case the sore was bivalve, occupying the conjunctival cul de sac and the palpebral and bulbar conjunctivae so that the two surfaces of the chancre came in contact when the eye was closed.

The patient will rarely seek advice during the early days of the development of the lesion although at the onset there is tumefaction of the lid which narrows the palpebral opening. Then the eyelid becomes red, or rather pink, over a certain area. There is little lacrymation, but a slight mucopurulent secretion can be seen at the base of the lashes and at the angles of the commissuræ which are stuck together. Pain is completely absent or at the most there is a feeling of tension or a foreign body in the eye. Occasionally the patient will at the same time notice a small red pimple which distinctly projects above the surrounding palpebral mucosa and at about the same time swelling of the preauricular lymph nodes will be noted and then the physician is consulted.

When seen at this phase of the process the eyelid will present a wine red color over a portion of its surface and in this area a marked induration will be detected by palpation, quite different to the feel from the cartilage of the tarsus. The eyelid is usually swollen and droops, and when the lesion is on the upper lid, the latter will overlap the lower lid. The tumefaction may be so pronounced, especially when the upper lid is the site of the process, that it cannot be turned out for inspection, so that it is impossible to see the chancre. If the lids are retracted the bulbar conjunctiva will be found much injected with a normal cornea and iris. By turning up the diseased lid the palpebral conjunctiva will be found much injected and within the congested area the chancre will be seen. By a careful analysis of the reported cases one may safely conclude that although in the majority the lesion was present in the form of an ulcer, there are some few in which the chancre assumed the aspect of a small nodular tumor.

In the ulceroerosive type of chancre the lesion offers itself as a round or oval ulcer the size of a ten cent piece, with little elevation of the edges which blend with the surrounding conjunctiva. The fundus of the sore is moist, shiny, muscle red or grayish white in color, bleeding slightly when pressed upon. Occasionally the surface of the sore is covered by a rather adherent false membrane which disappears as the chancre continues its evolution and if the lesion be seized between the fingers it will be found to lie upon a distinctly indurated zone. The same feel may be obtained when the lesion is palpated through the skin of the eyelid but it is not so distinct.

The ulcer is absolutely indolent and this is the more remarkable given the exquisite sensitiveness of the conjunctiva and intense photophobia to which the slightest lesion of this mucosa gives rise. It is only in cases where the microbic flora of the conjunctival cul de sac produce a secondary infection that symptoms of a true acute conjunctivitis—pain, photophobia, secretion—develop. If the chancre appears in the form of a small tumor, by turning back the diseased lid a growth the size of a small filbert or an almond will be found, yellowish gray in color, sometimes reddish, of hard parchmentlike consistency whose indurated base makes one with the conjunctiva, while the free aspect of the lesion faces the globe of the eye. At the onset of the process no trace of ulceration or erosion can usually be detected, but later the little tumor ulcerates from the centre to the circumference and then the picture is one of a typical chancre.

Enlargement of the lymph nodes occurs early in many cases, usually from the seventeenth to the twentieth day after onset, the preauricular and submaxillary glands being those involved. Usually the size of a bean, the preauricular lymph node may develop to the size of a pigeon's egg or an orange. In most cases the lymphatic involvement is unilateral but when bilateral it has been mistaken for mumps. The submaxillary glands may enlarge and occasionally some may be found in the cervical region and along the sternomastoid muscle on the same side.

The prognosis, as far as vision and the eye are concerned, is good. In one or two months after the onset the chancre disappears rarely leaving any trace of induration. The enlargement of the lymph nodes lasts somewhat longer. However, some times the evolution of the sore may give rise to complications. Aubineau has recorded an instance of interstitial keratitis which lasted ten months after the chancre had disappeared and it has been conclusively shown by a number of observers that the involved eye becomes a locus minoris resistentiæ for the future development of secondary and tertiary lesions. The progress of ulceration of the sore may result in adhesions between the two conjunctival surfaces or the disappearance of the conjunctival cul de sac producing a true symblepharon, but such cases are rare.

PREVENTIVE MEDICINE IN FRANCE.

Because of the present interest in a National Health Examination Day, it is significant to learn through the *Bulletin of the Academy of Medicine*, Paris, that an Institute for Preventive Medicine has been proposed for France. The proposal came through Professor O. Laurent, at a meeting of the Paris Academy of Medicine. His idea is to establish regional centres for periodical individual health examinations in French towns, most of which have x ray and chemical laboratories, the expense of these centres to be covered by individual or collective subscribers. This means that specialists would form themselves into regional groups for the examination of individuals, for each of whom a chart would be made out and a health bulletin given, together with the necessary advice as to personal care, but without interfering in any way with diagnostic clinics and treatment. These centres would be associaated with a general committee, from whom they would receive directions and supervision. For propaganda they would depend upon the medical profession, the Red Cross, and other health and welfare organizations. Professor Laurent mentions the Life Extension Institute of New York as an organization resembling somewhat the institute which he proposes be established in France.

Among the benefits of such an institute would be that to the individual, of health conservation and prolongation of life, and a complete health record for the use of the attending physician in case of sickness or accident; to the profession as a whole, as the quantity and variety of these records would constitute an actual and exceedingly comprehensive laboratory record of life itself, with the most valuable information of many public health problems.

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Obituary.

WILLIAM STEWART HALSTED, M.D.,

of Baltimore.

William Stewart Halsted, one of America's most prominent surgeons, died at the age of seventy on September 7th in Baltimore. Doctor Halsted was born in New York on September 23, 1852. He received his degree of A.B. from Yale University in 1874, and his degree of M.D. from the College of Physicians and Surgeons of Columbia University in 1877. He was honored with many other degrees from various colleges and universities, and was a member of a great number of medical societies, both American and foreign. For several years he served as attending physician in the Charity Hospital of New York city, and was also a member of the staff of Bellevue and the Presbyterian Hospitals. From 1881 until 1887 he was associate surgeon at Roosevelt Hospital, and surgeon in chief of the outpatient department. He served also in this capacity in the Emigrant Hospital of New York City. Since 1889 he had been surgeon in chief at Johns Hopkins Hospital, and professor of surgery in the same institution. Doctor Halsted was the author of many monographs and articles on surgery, pathology and physiology. His death occurred after an illness of several weeks following an operation.

GEORGE MILBRY GOULD, M.D.,

of Atlantic City, N. J.

George Milbry Gould, well known writer on medical subjects and compiler of several valuable medical dictionaries, died on August 8th at his home in Atlantic City, at the age of seventy-four. His death from heart disease came very suddenly after an illness of only a few hours. Doctor Gould was born in Auburn, Maine. He served in the civil war, first as a drummer boy and later as a volunteer. He was a student at Ohio Wesleyan University and received the degrees of A.B. and A.M. there. Later he entered the Harvard Divinity School and served as a clergyman until he decided to study medicine. He went to Jefferson Medical College, and received his degree in medicine in 1888, immediately after which he began practising ophthalmology.

He held during his lifetime the editorship of various journals, among them the *Medical News*, 1891-1895; the *Philadelphia Medical Journal*, 1898-1900; and *American Medicine*, 1901-1906. Doctor Gould was the first winner of the Doyne Medal of the Ophthalmological Congress at Oxford, England. Among his best known published works are several which are nonmedical, among them a collection of poems entitled *An Autumn Singer*, *Biographic Clinics*, *History of Jefferson College*, *Concerning Lafcadio Hearn*, *The Infinite Presence*, and *Life and Letters of E. C. Stedman*. His valuable work as an editor and compiler of medical dictionaries has also won for him a high place as a man of letters. Among these dictionaries are *The Student's Medical Dictionary*, the first edition of which was published in 1890 and the last, the eleventh, in 1900. His *New Medical Dictionary*, published in 1891, passed through ten editions, and the *Pocket Medical Dictionary* published its first edition in 1892 and its last in 1913. The *Practitioner's Medical Dictionary* was issued in various editions from 1906 until 1917.

While still a student, Doctor Gould collaborated in preparing a compend of diseases of the eye. Among his medical writings perhaps the best known is *Anomalies and Curiosities of Medicine*, written in collaboration with Doctor Pyle. Among other titles are *The Meaning and Method of Life*, *Borderland Studies*, *Suggestions to Medical Writers*, and *Righthandedness and Lefthandedness*. He was a frequent contributor to many standard medical reference works, such as the American Yearbook of Medicine and Surgery. Throughout his lifetime, Doctor Gould's service to mankind was constantly broadened by the variety of his interests.

HAROLD CLARENCE ERNST, M.D.,

of Boston.

The science of bacteriology, especially as applied to infectious diseases, lost one of its most prominent exponents on September 7th in the death of Dr. Harold Clarence Ernst. Although Doctor Ernst was born in Cincinnati, for many years he had made his home in Boston, and it was here that he died at the age of sixty-six. After obtaining his degrees of A.B., M.D. and A.M., at Harvard University, Doctor Ernst was immediately appointed instructor in bacteriology in that institution. He soon was made assistant professor, and in 1895 professor of the same subject, in which capacity he was serving at the time of his death. He was the author of many monographs and articles on his specialty, among them The Infectiousness of Milk, Infection and Immunity, Animal Experimentation, and Modern Theories of Bacterial Immunity. He had been editor of the *Journal of Medical Research* since 1896. During the recent war he served as major in the Medical Corps of the United States Army. Among prominent offices held by Doctor Ernst were the presidencies of both the Boston Society of Medical Research from 1898 until 1908, and the Association of American Pathologists and Bacteriologists, in which latter capacity he was serving at the time of his death.

News Items.

Harvey Society Lecture.—The first lecture of the Harvey Society will be delivered at the New York Academy of Medicine on Friday evening, November 3, 1922, by Dr. H. J. Hamburger, professor of physiology at the University of Groningen, Holland. The subject of the lecture will be The Increasing Significance of Chemistry in Medical Thought and Practice.

Evening Clinic at the Reconstruction Hospital.—The Reconstruction Hospital, 100th Street and Central Park West, has established a physiotherapy clinic for evening treatment of patients of both sexes who, for any reason, are unable to attend during the day. Particulars may be had by writing or calling at the hospital, or by telephone, Riverside 8000.

American Proctologic Society.—Announcement has been made that, at the twenty-third annual meeting of the American Proctologic Society held last May, the following officers were elected: President, Dr. Emmet H. Terrell, of Richmond, Va.; vice-president, Dr. William H. Kiger, of Los Angeles; secretary-treasurer, Dr. Ralph W. Jackson, of Fall River, Mass.; executive council, Dr. Granville S. Hanes, of Louisville, Ky.; Dr. Emmet H. Terrell; Dr. Descum C. McKenney, of Buffalo; Dr. Ralph W. Jackson.

The Antivivisectionist Nuisance.—In Colorado the antivivisectionists have secured a certain amount of public support as well as the endorsement of some of the papers of a bill now before the legislature of that state, prohibiting the administration of any drug or any surgical operation which has not for its object the relief and cure of the person or animal so treated. The question will be decided by popular vote at the election in November. Should the measure become law, progressive physicians would do well to move into some other state.

Smallpox in New York State.—One hundred and forty-six cases of smallpox have been reported in New York State, outside of New York city, since the first of January of this year. A threatening outbreak on the St. Regis Indian Reservation began early in September and has only been checked by a wholesale campaign of vaccination directed by the State Department of Health. With repeated local outbreaks and constant danger of infection, the State Commissioner of Health, Dr. Hermann M. Biggs, considers the situation sufficiently serious to urge upon the public the importance of vaccination.

Surgical Operation at Sea.—Dr. Fred H. Albee, of New York, returning on the White Star liner *Homeric* from Paris, where a few weeks ago he addressed the Medical and Surgical Congress of France on bone graft surgery, was called in consultation by the ship's surgeon, Dr. R. S. French, and performed an operation for appendicitis during the trip upon Mrs. R. A. Williams, wife of an American missionary to the Belgian Congo on her way home to San Bernardino, Cal. The ship was not stopped during the operation, as she was working a slow, careful passage at greatly reduced speed through the fishing fleet on the Grand Banks. The patient was taken to the Presbyterian Hospital on reaching port.

Civil Service Examination for X Ray Mechanician.—The United States Civil Service Commission announces an open competitive examination for an x ray mechanician, receipts for the application of which will close on November 14, 1922. The vacancy to be filled is in the Veterans' Bureau, Washington, D. C., at $200 a month.

A Typhoid Carrier Menace.—The State and local health authorities have recently identified another dangerous typhoid carrier who first came under observation some six years ago. The first patient believed to have been infected by this carrier contracted typhoid in 1900. Since that time ten other persons have been directly, and one indirectly, infected.

The Alvarenga Prize of the College of Physicians of Philadelphia.—Essays for the Alvarenga Prize intended for competition may be upon any subject in medicine, must be unpublished, typewritten, and received by the secretary of the college on or before May 1, 1923. The award will be made on July 14, 1923.

Personal.—Dr. Anthony Bassler has been appointed consulting gastroenterologist to St. Vincent's and the Jewish Memorial Hospitals, and gastroenterologist (courtesy) to the Fifth Avenue Hospital.

Dr. Leon Bernard, professor of hygiene in the University of Paris, and secretary of the National Antituberculosis Association recently organized in France, arrived in the United States on October 10th to study American public health methods.

Fellowship of Medicine and Postgraduate Medical Association Lectures.—The postgraduate lectures of the association for the winter session of 1922 will be delivered in the West Lecture Hall of the Royal Society of Medicine, London, between October 11th and December 12th, and are open to all members of the medical profession. Among the speakers yet to appear are Dr. C. E. Lakin, Mr. Zachary Cope, Mr. W. Sampson Handley, Dr. S. A. Kinnier Wilson, Mr. J. D. Mortimer, Dr. Robert Hutchinson, and Prof. W. S. Lazarus-Barlow.

Cholera Relief in the Ukraine.—The American Relief Administration reports from Moscow that cholera, which was epidemic in the Ukraine this past summer, has practically disappeared. Serums for inoculation were furnished and administered by the association. The American Relief Association is to be congratulated on its successful campaign in bringing about improvements in conditions which resulted in the reduction of only twenty-six per cent. of cases from April to August during the epidemic of 1910, to a reduction of sixty-six per cent. in 1921, and to ninety-eight per cent. in 1922.

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Died.

Bassett.—In Cooperstown, N. Y., on Saturday, October 21st, Dr. Mary Imogene Bassett, aged sixty-six years.

Forman.—In Auburn, N. Y., on Tuesday, September 24th, Dr. Andrew John Forman, aged forty-nine years.

Garvin.—In Lomsdale, R. I., on Monday, October 2nd, Dr. Lucius Fayette Clark Garvin, aged eighty-one years.

Merrill.—At Brooklyn Navy Yard on Monday, September 25th, Dr. Henry P. Merrill, aged forty-seven years.

Rosenthal.—In New York, on Thursday, October 19th, Dr. Louis Rosenthal, aged forty-seven years.

Shere.—In Denver, Colo., on Wednesday, October 18, Dr. Oscar M. Shere, aged forty-four years.

Book Reviews

GONORRHEA.

A Textbook on Gonorrhea and Its Complications. By Dr. GEORGE LUYS, Late Assistant to the Urological Clinique, Hospital Lariboisiere, Paris, Chief Medical Officer of the Urological Centre at the Military Hospital, Versailles. Translated and Edited by Arthur Foerster, Captain R.A.M.C., M.R.C.S., L.R.C.P. (Lond.) Third Revised Edition with 212 Illustrations and five colored plates. New York: William Wood and Company, 1922. Pp. xvi-400.

The third edition of Luys's well known work on gonorrhea appears in the same agreeable form and outward appearance as its predecessors. The general character of the work has not been changed, and, as in the previous editions, the author devotes most of his attention to urethroscopy and urethroscopic therapy, for which he has become famous in his specialty.

A number of changes have been made, however, which add much to the utility of this work. New black and colored drawings have been added, and certain portions of the text have been changed to bring them up to date. New text matter includes the surgical treatment of acute gonorrheal epididymitis, Belfield's vasotomy for vesiculitis, and the vaccine treatment of gonococcal complications. Most of the newer remedies are discussed from the clinical point of view, and proper regard is paid by the author to the writings and inovations of American urologists, with whose work he seems to be commendably familiar.

On the whole, we regard this work as without a peer among textbooks on gonorrhea, and this translation should prove most valuable to English reading physicians who wish to treat gonorrhea intelligently. We commend this volume unhesitatingly as the best of its kind in the English language.

SYPHILIS.

Atlas of Syphilis. By Professor LEO v. ZUMBUSCH, Munich. With 63 Illustrations Taken Direct from Nature by Color Photography, and one single Color Illustration. New York: William Wood & Co., 1922. Pp. 35.

This atlas, according to the publishers' preface, is the first attempt to place at the disposal of the profession a series of colored photographs taken directly from the patients by the new process of color photography. With the exception of four beautifully stained specimens showing spirochetes, the atlas presents sixty illustrations of syphilis in its various phases, from the primary ulcer, in both sexes, to the tertiary and congenital conditions. It may be stated, without fear of contradiction, that the efforts of the author and the publishers have produced a volume of exceedingly great beauty and truthfulness to life. There is a refreshing difference, appreciably noticeable, from the illustrations hitherto published, which have been painted by artists. The camera has succeeded in reproducing the most beautiful and lifelike tints, some of them startling in their resemblance to the actual lesion. The author has used good judgment in showing examples of the most usual forms of syphilis only, inasmuch as the volume is intended to help the student and general practitioner, and not the expert. The new method of color photography was devised by Dr. Traube, who is to be congratulated on his achievement. He has succeeded in reproducing syphilitic lesions in a manner far superior to anything that we have heretofore enjoyed. The translation of the legends has been made by Dr. J. Snowman and they are fully adequate for their purpose. The volume is beautifully printed and simply mounted in cloth, and constitutes a really useful addition to the many atlases that have preceded it.

INFLUENZA.

Influenza. Essays by SEVERAL AUTHORS. Edited by F. G. CROOKSHANKS, M.D., F.R.C.P. London: William Heinemann, Ltd., 1922. Pp. 529.

This book contains essays on influenza by well known British and American authorities. It is not only a treatise on treatises on influenza but a survey of epidemiology in general. Dr. Hamer, the leader of British epidemiologists, a student of Creighton and upon whom the mantle of Creighton seems to have fallen, contributes a chapter entitled The Phase of Influenza. He declares that influenza has had always three distinctive characteristics: 1. Its "posting character" involving large areas of the inhabited globe and prevailing in each affected community for some three or four months at a time; 2, its power of impressing the minds of observers as being a new disease; and 3, its protean manifestations. Dr. Crookshanks himself contributes seven of the seventeen chapters. The motive running through all these chapters is that the method of Hippocrates is the only one to be followed, and that unless this is done nothing of consequence will be evoked. Perhaps the author's contributions will attract the most attention, for not only has Dr. Crookshanks decided views but he expresses these with so much conviction that he cannot fail to provoke those who disagree with him. He seems to believe, at any rate as far as epidemics are concerned, that there is nothing new under the sun, and who can say him nay. Probably epidemics may have somewhat modified their character in accordance with the periods in which they have occurred but their general characteristics no doubt remain the same.

The author may be unduly contemptuous of bacteriologists, he appears to think that when one or other of them states that a certain organism is the cause of a new disease that really he is only displaying his ignorance. True it is that it has happened more than once that a bacteriologist has asserted that he has discovered the causative germ of a disease and has been found to be wrong. It appears that this is the case with Pfeiffer's bacillus and influenza. However, one cannot brand all bacteriologists as futile because they make mistakes. It is human to err and it may be pointed out that clinicians are not always right nor, it may be said, are historians, for after all history itself is largely based on tradition. Modern bacteriological work has been and is of epidemiological importance, while possibly not of so great importance as bacteriologists conceive it to be.

Dr. Crookshanks is a truly refreshing writer for the reason that he has the courage of his convictions and expresses his views emphatically and these views will compare favorably with those of the men who disagree with him. It is certainly correct to state with regard to influenza, that if history may be trusted, its chronological development through the ages was an orderly process. Dr. Dwight Lewis, of New Haven, Conn., writes on Some Epidemiological Considerations Concerning the Prevention of Influenza, and Dr. Smith Ely Jelliffe contributes one of the best chapters of the book on The Nervous Syndromes of Influenza. This chapter is excellent throughout and well upholds the reputation gained by American neurologists. It is superfluous to say that influenza affects the nervous system profoundly, and those of a highly strung nervous system who have the misfortune to contract influenza are afflicted with nervous manifestations in various forms, as Dr. Jelliffe points out.

Dr. Adolphe Abrahams writes instructively and from experience of that deadly type of influenza of a purulent bronchitic character which Dr. Herbert French and Dr. Abrahams and Dr. Norman Hallows investigated at Aldershot in 1915 and 1916 and wrote on in the *Lancet,* January 1, 1919. At that time it was regarded as a new disease, but when the matter was more closely looked into it was found to be present or to have existed at precisely the same time in France and in various parts of the British Isles. Dr. Abrahams's contribution in this book is really an expansion of the paper which appeared in the *Lancet* and no better or more accurate description of this extremely fatal form of influenza has ever been penned.

Dr. Robert Donaldson writes on the Bacteriology of Influenza and assuredly has spared no pains to present the subject in a most exhaustive manner. Like many others Donaldson does not believe that Pfeiffer's bacillus is the sole cause or the originating cause of influenza. In his opinion Bacillus pfeifferi is a secondary invader which flourishes in tissues damaged already by another virus—moreover he cannot discover any evidence that the infection is due to a socalled filter passing virus. Mr. J. McHoul deals with The Ocular Affections in Influenza. Mr. H. Lawson Whale with The Complications Affecting the Throat, Nose, and Ear; Mr. Haldin Davis with The Skin Lesions of Influenza, and Mr. Bourne writes on Influenza, Pregnancy, Labor, the Puerperium, and Diseases of Women. The Surgical Aspects of Influenza are dealt with by Mr. Sidney Boyd. The chapters written by Dr. Crookshanks are Method and Thought, First Principles of Epidemiology, Some Historical Conceptions of Influenza, The Name and Names of Influenza, The History of Encephalomyelitis in Relation to Influenza, and he concludes with two chapters, The Theory of Influenza and In Brief.

The book is a remarkably keen and philosophical consideration of influenza from almost all aspects. It is well arranged and carefully revised, and there are few typographical errors. The book may be strongly commended.

PSYCHOLOGY.

The Fundamentals of Psychology. Illustrated. By W. B. Pillsbury, Professor of Psychology, Director of the Psychological Laboratory, University of Michigan. Revised Edition. New York: The Macmillan Company, 1922. Pp. xiv, 589.

An Introduction to Psychology. By Susan S. Brierley, M.A. London: Methuen & Co., Ltd., 1922. Pp. 152.

Elements of Scientific Psychology. By Knight Dunlap, Professor of Experimental Psychology in the Johns Hopkins University. St. Louis: C. V. Mosby Company, 1922. Pp. 365.

Pillsbury presents a typical armchair psychology with a trifle less physiology of the special senses, which we have grown to call psychology, than most books of this type contain. Whenever matters of vital import are discussed so much pruning and smug rationalization intervene as to make the conclusions valueless.

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Susan S. Brierley has given us one of the few books that is worthy of the name of psychology. Under the modest title of An Introduction to Psychology she has set forth in a simple and most attractive manner most of the essential outlines of a basic psychology. A careful reading of this most valuable book will convince the physician, or any honest student for that matter, that most of the slush brought out by test tube psychologists is as innocuous as a castrated fish. All in all this is a splendid book and a real psychology which would be of service to every practitioner.

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Dunlap's well printed book was obsolete many years before it was written. Within its pages one may find a choice collection of what is not so, set forth in a most dictatorial fashion, strongly recalling the monotonous droning heard in the classrooms of so many of our archaic colleges. Again we see the physiology of the senses advertised as psychology and a boisterous howl at anything which attempts to include more than this under the caption of the function of mind. That books of this type should be classed as psychology is a painful joke. More knowledge of psychological essentials will cast them into limbo in the near future.

RICKETS.

Rickets. A Study of Economic Conditions and their Effects on the Health of the Nation. By J. Lawson Dick, M.D., F.R.C.S., Eng., Deputy Commissioner of Medical Services, London Region Ministry of Pensions. In Two Parts Combined in One Volume, Freely Illustrated. London: William Heinemann, Ltd. New York: E. B. Treat & Co., 1922. Pp. 488.

Views as to the etiology of rickets seem to have changed and to be changing considerably. Not long ago it appeared that rickets would be definitely placed in the category of dietetic deficiency diseases, with beriberi, scurvy and perhaps pellagra. The lack or absence of the fat soluble A vitamine was given as the main dietetic cause. Within recent years, however, defective hygiene and faulty environment have been advanced as the cause and vitamine deficiency has been relegated to the background. So that at the present time there are two schools, one of which still contends that a dietetic deficiency is the main cause, not necessarily a vitamine deficiency, while the other school maintains that diet has little or no bearing on the question, and that defective hygiene and especially lack of sunlight and fresh air is the most potent factor by far. Dr. Dick is a hard and fast supporter of the latter school and brings forward an imposing array of facts tending to drive home the argument. He attacks the vitamine deficiency theory in particular and devotes much space to a consideration of the arguments for and against this theory. Naturally he adduces all the evidence that goes to show that fresh air, sunshine, and good hygienic surroundings are the most important etiological factors. The book is well compiled and shows that the author's knowledge of the literature of rickets is remarkably extensive. The volume is of interest and importance from beginning to end.

FORENSIC MEDICINE.

A Textbook of Medical Jurisprudence and Toxicology. By JOHN GLAISTER, M.D., D.P.H. (Camb.), F. R. S. E., Professor of Forensic Medicine and Public Health in the University of Glasgow; ex-President and Fellow of the Royal Faculty of Physicians and Surgeons; Examiner in Medical Jurisprudence and Hygiene to the Royal Colleges of Physicians and Surgeons in Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow for Diplomas in Medicine and Surgery and Examiner in Public Health for the Diploma in Public Health of these United Corporations, etc. Fourth Edition. With 137 Illustrations and One Colored Plate. New York: William Wood and Company; Edinburgh: E. and S. Livingstone, 1921.

The fourth edition of this work is the first edition to be published in this country, and deserves more than the mere announcement of a new edition. The book has one drawback, namely, that the legal procedure, enactments, and other details are those of English and Scotch law. But in spite of this drawback the volume is one of more than usual value. The reader will find in it chapters on the subjects generally discussed in works of medical jurisprudence and toxicology, but he will also find numerous sections of interest on such subjects as identity, misidentification, handwriting, mistaken identity, deformities, death in its medicolegal relations, death by roentgen rays, etc. The book is written by one who has had a large experience in the special subjects treated herein; and the numerous references to modern cases are of distinct value. Each chapter is packed with information and is written in an easy and convincing style; the author appreciates the difficulties of the student and at the same time knows the wants of the practitioner and the help which the latter will require when called on to appear in court. This latter point is one of the chief features of the book, and it distinguishes this from other works on the same subject. All the standard books give a chapter on this topic; but Glaister's book is the only one (so far as we know) which keeps in constant view this aspect of the subject under discussion. The author gives ample references to the literature of the subject; he discusses the views of other recognized authorities, and does not hesitate to say when, where, and why he has been compelled to differ from them. Even with the handicap referred to above, this book can be recommended to both students and practitioners as the most satisfactory one volume work on medical jurisprudence and toxicology.

HEMOSEXUAL LEVELS.

One of Ours. By WILLA CATHER. New York: Alfred A. Knopf, 1922. Pp. 459.

The vision, the welding of the tale into a tragic poem, takes place on the last page of this book. Before that the story has flowed along like a quiet current, through the sun and shade checkered inevitabilities of a young man's life. Claude Wheeler lives on a farm, he grows up, studies, marries, goes to war. He is in doubt, restless at heart, longing for something that shall satisfy his idealism. The war brings fulfilment, and at its crest he dies, spared the disillusionment fated for his nature.

This seeking, seeking, and never finding points the medical reader at once to latent homosexuality. We find the theory borne out by Claude's friendships, all those young men in whose company he finds freedom and inspiration. There was his boyhood chum, the little Bohemian emigrant, at college a group of brothers devoted to their mother, there is the young aviator with a mistress old enough to be his mother, finally there is the professional violinist. The unfeminine Enid whom Claude marries, and who later leaves him to follow her sister as a missionary to China, adds a strengthening note to the curious disharmonies of Claude's life. Needless to say in his own home he is the closest to the mother.

It is the current tendency to feature the sexually abnormal as heroes and heroines of fiction. Or, better perhaps, it is the tendency to recognize certain earmarks of abnormality with greater openness. At all events the problem of the ill adjusted individual draws constantly closer to solution by means of books such as *One of Ours.* Not Miss Cather's solution; that is the final flight, the complete deterioration that brings these victims to the physician if they survive physically. For us, half the battle is gained when we are no longer in the dark as to causes.

ANIMAL BEHAVIOR.

Kittens: A Family Chronicle. Translated from the Danish of Svend Fleuron, by DAVID PRITCHARD. Foreword by CARL VAN VECHTEN. New York: Alfred A. Knopf, 1922. Pp. 248.

This is a delightful child's book. Whereas *Grim: the Story of a Pike* is a classic for all ages, *Kittens* does not emerge from the juvenile rating. It is an entirely adequate and sympathetic natural history of cat life, located on a Scandinavian farm. The little mother is running wild; her offspring are reared with rare intelligence. Nature and the mother's instinct can be traced working hand and hand, in the lives of these individual little kitten characters. There are passages in the book that are very beautiful. At times the subtle psychological keenness that made *Grim* such a delight is apparent. The whole is pleasing, but there seems to be an occasional let down in style, in attitude toward the work, as though the author from time to time grew weary of the triviality of his subject. We should say that the book had suffered the usual vitiation of the sequel.

Medicoliterary Notes.

Mr. Robert Keable is a young writer sincerely interested in people, love, and, incidentally, life. He has told us about some of the things he has found out, and his longing to know more, in two books of the year, *Simon Called Peter* and *The Mother of All Living; a Novel of Africa.* The latter title is something of a misnomer, as there is very little about Africa in the book, except that the story is laid in Africa, and we have some beautiful descriptions of African scenery, probably the best parts of the book. The story is tedious in some places and hurried in others, and the characters do not seem to ring very true. Yet the tale is quite readable on the whole, and at times has elements of a real "thriller." *Simon Called Peter* is a record of the investigations of a young Episcopal clergyman into love and life during a chaplaincy in the war. Mr. Keable's work shows considerable literary promise and a real sincerity of purpose.

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In *Mental Hygiene* for July Dr. Charles E. Nixon, instructor in nervous and mental diseases at the University of Minnesota, has a suggestive article on The Study of Individuality. Doctor Nixon makes the crux of his discussion the fact that, although in early psychiatric studies of dependent groups stress was laid upon the subnormal intelligence of these groups, now the viewpoint has changed and emphasis is placed upon abnormalities of personality as causative factors of dependency. "The reason that these people are misfits, failures and criminals is because of abnormalities in more than one particular phase of their individualities; in other words, the individual as an entity is abnormal in his reactions—not that there is merely a defect in his intellect, emotions, or character."

* * *

A welcome new note has apparently been struck and appreciated in theatrical productions of the review type. This new note is evident in both the Ziegfeld Follies, which have been running since early summer, and the recently staged Greenwich Village Follies. Instead of the jumble of inanities and coarse jokes and "stunts" visited upon the public during the war period, perhaps for lack of better material, with bits of good dancing from the *Folies Bergères* thrown in, and, perhaps worst of all, a total lack of any vocal ability on the part of the singers, we now have leaders of choruses who can at least sing popular songs without too much offense to the ear, excellent dancing and ballet work, real fun and clever jokes, and a marvelous use of light and drapery in producing beautiful and gorgeous stage effects. The rendering in the Greenwich Village Follies of the *Legend of the Nightingale* is one of the most artistic things ever seen on the New York stage.

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Reports continue to come in concerning the almost desperate condition of the medical profession in Russia. Doctors, together with the rest of the intelligentsia, are suffering the most extreme hardships. Although under a new economic policy physicians are now allowed to charge for their services, only a few of the people are able to pay and these patronize the older and better known doctors. It is reported that there are twelve hundred physicians in Odessa, fifty of whom have a good practice, two or three hundred make enough to support their families, and the rest must sell their personal property to eke out their scanty incomes.

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A new departure in book reviewing has been inaugurated by Dr. William L. Stidger, a prominent clergyman of Detroit. Doctor Stidger asserts that his inspiration came from reading William Allen White's novel, *In the Heart of a Fool.* He preaches once a month what he calls a "book sermon" in which he comments on some well known and worth while current work, either fiction or otherwise. Also once a month Doctor Stidger holds what he calls a book prayer meeting at which members of the congregation report on books supplied to them by the pastor. Doctor Stidger's aim is to arouse interest in and so promote the proper kind of reading among members of his congregation, especially the younger people.

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E. Blanche Sterling, acting assistant surgeon of the U. S. Public Health Service, has in the *Public Health Reports* of August 25th a valuable study of the posture of school children in relation to nutrition, physical defects, school grade and physical training.

New Publications Received.

THE PRACTICE OF MEDICINE. By A. A. STEVENS, M.D. Philadelphia and London: W. B. Saunders Company, 1922. Pp. 1106.

PRINCIPLES AND PRACTICE OF X RAY TECHNIC FOR DIAGNOSIS. By JOHN A. METZGER. St. Louis: C. V. Mosby Company, 1922. Pp. 144.

THE PROMISED ISLE. Translated from the Danish of LAURIDE BRUUN, by DAVID PRITCHARD. New York: Alfred A. Knopf, 1922. Pp. 243.

BIOLOGISCHE VORFRAGEN DER EXPERIMENTELLEN TUBERKULOSEFORSCHUNG, VOM DERMATOLOGISCHEN STANDPUNKT AUS. Von Prof. Dr. A. JESIONEK. Leipzig: Verlag von Johann Ambrosius Barth, 1922.

THE HEALTHY BABY. The Care and Feeding of Infants in Sickness and in Health. Second Edition, Revised. By ROGER H. DENNETT, B.S., M.D. New York: The Macmillan Company, 1922.

TRAITÉ DE PATHOLOGIE MÉDICALE ET DE THERAPEUTIQUE APPLIQUÉE. Publie sous la Direction de ÉMILE SERGENT, L. RIBADEAU-DUMAS, et L. BABONNEIX. X. Sang, Organes hématopoiétiques, Rate, Os. Paris: A Maloine et Fils, 1922. Pp. xix-544.

PRACTICAL ZOOLOGY FOR MEDICAL AND JUNIOR STUDENTS. By J. D. F. GILCHRIST, M.A., D.Sc., Ph.D., and C. von BONDE, M.A. New York: William Wood and Company. Edinburgh: E. & S. Livingstone, 1922.

LES MEDICATIONS PSYCHOLOGIQUES. Etudes Historiques, Psychologiques et Cliniques sur les Methodes de la Psychotherapie. Par Le Dr. PIERRE JANET. Vol. I: L'ACTION MORALE, L'UTILISATION DE L'AUTOMATISME. Vol. II: LES ECONOMIES PSYCHOLOGIQUES. Vol. III: LES ACQUISITIONS PSYCHOLOGIQUES. Paris: Librairie Felix Alcan, 1919.

L'ORGANISATION DE LA MATIERE DANS SES RAPPORTS AVEC LA VIE. Par JEAN NAGEOTTE, Professor au College de France Médecin de la Salpetriere. Avec 152 figures dans le texte et 4 planches contenant 16 figures, dont 14 microphotographies autocromes. Paris: Librairie Felix Alcan, 1922. Pp. vi-560.

Practical Therapeutics

CLINICAL RESULTS OBTAINED BY THE INTRAVENOUS INJECTION OF HEXAMETHYLENAMIN.*

By Edwin S. Cooke, M. D.,
Philadelphia.

Assistant Genitourinary Surgeon, Philadelphia General Hospital,
Assistant Surgeon, State Venereal Dispensary, Philadelphia.

In my personal experience the oral administration of hexamethylenamin had been productive of such indifferent results that I ceased to entertain the most favorable opinion of the drug or to employ it frequently even in those cases of cystitis for which it had been so highly recommended. When I did occasionally administer it I did so, more with the hope that it might be of benefit, than with that confidence which should characterize the employment of a well-known drug. Subsequently I abandoned it altogether as a practically useless therapeutic product.

This cynical attitude underwent a change in 1920, when an opportunity arose for the personal observation of several more or less advanced cases of cholecystitis, which were treated with hexamethylene, and apparently derived great benefit from the venous infusion of small doses of the drug. The facts that each of the patients so treated gave a history of prolonged illness, with no improvement after the usual routine of ordinary medical treatment; and that surgical operation had been recommended as imperative in at least one instance; and that after a course of ten or twelve intravenous injections of hexamethylene the paroxysms of pain ceased and all other clinical symptoms disappeared—these facts taken together led to the conclusion that the hexamethylene was responsible for the changed condition, and that the intravenous employment of the drug had much to do with enhancing its value.

About twenty-five years ago when hexamethylene was first introduced to the medical profession, under the trade name of urotropin, it was exploited as the remedy *par excellence* for urological conditions. The results of its use in the treatment of cholecystitis, however, seemed to indicate that the liver and gallbladder were most potently affected by the drug, and I had so concluded when the reports of Loeper and Grosdidier came to my attention, and I discovered that those two observers, as well as others, had used hexamethylene infusions with good results not only in such cases, but also in urological and many other conditions, notably typhoid fever, pneumonia, and bronchopneumonia.

According to these observers the drug exercised a great influence upon the renal output, temperature, hepatic functions and the general condition of each individual patient, and their reports were so encouraging that I became sufficiently interested to undertake a few experiments for my own personal observation, choosing as my first subject a man, aged thirty years, who suffered from chronic posterior urethritis, and had derived but little benefit from the more or less systematic employment of massage, irrigations, deep instillations, and instrumentation, all of which had failed to prevent acute or subacute exacerbations after sexual activity or alcoholic ingestion, or to remove the cloudiness and prostatic shreds from the first urine. No Neisserian bacilli were discovered in the specimen expressed from the prostate, but pus cells were present in large numbers, and the patient complained bitterly of the general malaise, backache and other symptoms characteristic of focal infection. Since removal of a focal infection is always imperatively indicated, it is, of course, needless to state that local measures were not abandoned when the infusions of hexamethylene were begun. It is significant, however, that the addition of the treatment with the drug infusions was soon followed by a marked improvement in all the symptoms, and in due time by a clinical cure.

Encouraged by this result, another prostatic case was selected. This patient was a man over fifty years old, who gave a history somewhat similar to that just reported, and in addition was extremely nervous, in fact, a typical sexual neuropath.

Seven years prior to date of first examination he had contracted gonorrheal urethritis, which became chronic, and so affected the prostate that two years later he was treated for follicular prostatitis by a prominent surgeon, who had employed local electrotherapeutic measures with apparently excellent results, for the patient was discharged as cured, and remained fairly well for a time.

After several years, however, the dampness of the urethra again became troublesome, and as this was accompanied by a weight in the perineum, backache, and general malaise, the patient again consulted the surgeon who had previously treated him. By him he was referred to me and I immediately instituted the treatment by intravenous injection of hexamethylene, accompanied by prostatic massage and urethral irrigations. The urine in this particular case was loaded with shreds when the treatment was begun, and absolutely free from them after a reasonable length of time. In all, there were thirty-five injections given, the interval being three days between treatments. In my opinion not all of these injections were absolutely necessary, as indications for their use had disappeared after perhaps half that number had been administered. The patient was apprehensive, however, and insisted on further treatment for fear of a relapse, and for psychological reasons this was administered.

It would be possible to greatly multiply the reports of prostatic cases, for results in my experience with a group of twenty-five or more were eminently satisfactory. Perhaps sufficient has been expressed, however, to stimulate interest and lead to further research by other observers, who may themselves arrive at definite conclusions along these particular lines. If this is accomplished, the object of the paper will be attained, for it is not my intention to attribute any wonderful virtues to the drug under observation, but rather to endeavor to determine from personal and other experiments what its true status actually is.

An experience with a persistent case of hematuria may not prove uninteresting, and more especially for the reason that when given in large doses hexamethylene may itself produce a condition similar to that for which it was apparently instrumental in effecting a cure.

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*Read before the Philadelphia Urological Society, April 24, 1922.

A gentleman, aged seventy-two, was referred to me for advice, and gave a history of having voided pus and blood in the urine during a period of several years. A first class urologist had treated the patient during most of the time, and was able to improve the condition slightly by cystic irrigation and silvol instillations, but for some reason this physician was not accessible at the time when the patient came under my observation.

Upon examination the hematuria was discovered to be due to an ulcer at the left ureteral orifice, with a purulent discharge from the corresponding ureter, which connected with an atrophied and apparently functionless kidney. These findings corresponded with those originally observed when the patient consulted his first physician, and the patient stated that operation was at that early period recommended and declined.

The bladder was irrigated with weak permanganate of potash solutions and the instillations of silvol were also continued, for they were both familiar to the patient and regarded by him as somewhat beneficial, and in addition thereto the intravenous injection of hexamethylene was resorted to with apparently excellent results, for the hematuria promptly subsided after three or four treatments, and up to the present time, after a lapse of seven months, has not reappeared.

The encouragement derived from its administration in chronic cases prompted me to experiment with hexamethylene infusions in acute diseases and epididymitis was selected as most appropriate. In each case so treated it happened that the patient was not obliged to remain in bed or to discontinue his usual employment. Sedatives locally applied, and the mechanical support of properly fitting suspensory bandages were, of course, employed. No medication by mouth, and an intravenous injection of one quarter gm. hexamethylene constituted the entire régime. Pain disappeared promptly, temperature became normal, and the swelling promptly subsided in every case. I regret that my observations were limited to five patients with acute epididymitis, but I was encouraged by the results obtained and hope to pursue the study farther.

Other acute and chronic diseases treated with apparent success were cystitis, pyelitis, purulent inflammation of the prostate, phosphaturia and vesiculitis. Some patients became clinically well, others were more or less improved, and none were unfavorably influenced.

The experiments were conducted during a period of a little more than a year, and in all there were seventy-five patients treated. Intravenous injection of the drug was regarded with favor by the patients in almost every instance, and since no unpleasant systemic reactions follow the infusion, it seems to offer most promising possibilities.

With regard to the preparation of the drug, it would seem that any manufacturers of high grade intravenous products might be regarded as reliable. No doubt there are many perfectly satisfactory preparations available.

The hexamethylene content in the preparation I used was very small and in the early experiments I employed two or three ampoules at one time. This was done upon the theory that the virtues of the drug deepened upon the liberation of formaldehyde, and that the amount of formaldehyde contained in one quarter gm. was too small to be of benefit as an antiseptic. In urine excreted after injecting one quarter gm., however, formaldehyde was found in a proportion of less than one to five thousand in patients who nevertheless appeared to derive great benefit from the venous infusions. I therefore decided to adhere to the small doses, and hope that subsequent developments may explain this phenomenon and more fully determine the physiological action of the drug. Perhaps some biochemical reactions or changes occur in the system that have not yet been discovered. At any rate, the small dose always proved as efficacious as the larger, and since hematuria has been known to follow large doses it is the part of wisdom to act conservatively and use no more than necessary.

The infusions may be made with impunity at daily intervals, and in acute cases this appears to be desirable. An interval of two or three days, however, was generally permitted to elapse in the experiments now reported, as the conditions were usually chronic.

No definite number of injections should ever be regarded as a standard sufficient for all cases, but in my experience an average of ten to twelve were given with perfectly satisfactory results.

SUMMARY.

First: Hexamethylene may be employed with impunity in both acute and chronic cystitis, pyelitis, prostatitis, urethritis, and bacteriuria in general.

Second: The intravenous route is the method of choice.

Third: Small doses are sufficient when administered intravenously.

1831 Chestnut Street.

Pyelitis.—A. E. Sohmer (*Minnesota Medicine*, May, 1922) states that bacterial invasion of the kidney may occur in four ways, hematogenous, urogenous, by contiguity, and through a penetrating wound. The hematogenous route is by far the most frequent, with the urogenous next. The treatment always begins with the removal of the cause. In acute cases, put the patient to bed, keep the body warm, give large quantities of fluid by mouth and alkalinize the urine, avoid highly seasoned foods, alcohol, proteins and irritating drugs. A good rule is to begin with alkalinization of the urine when the reaction is acid, and to acidify the urine when it is alkaline and then alternate these treatments. This alternating method has a definite destructive action on bacteria and is less irritating to the inflamed organs than a continuous use of one line of treatment. Hexamethylenamine, with monobasic acid sodium phosphate, may be alternated every five to seven days with citrate of potash. Vaccines are of doubtful value, while lavage and instillation into the renal pelvis have been of some value.

Proceedings of Societies

NEW YORK ACADEMY OF MEDICINE.

SECTION IN GENITOURINARY SURGERY.

Meeting Held on Wednesday Evening, February 15, 1922.

Dr. Abraham Hyman in the Chair.

A New Cystoscopic Table.—Dr. Oswald Swinney Lowsley demonstrated a new cystoscopic table which is described on page 528 of this issue.

Dr. Leon T. LeWald said that for years he had been trying to combine a stereoscopic x ray table with a cystoscopic one, and now a new complication had arisen in connection with the Potter-Bucky diaphragm, and he asked if Dr. Lowsley saw any possibility of working in connection with his table a stereoscopic x ray apparatus. Possibly a tunnel could be fastened on the top to permit the making of stereoscopic plates.

Dr. A. R. Stevens asked if Dr. Lowsley had compared the low position of the kidney with the table in the upright position with the patient's legs flexed and the patient sitting. It would seem that with the legs flexed, the kidneys might not fall as much as in the upright posture.

Dr. Lowsley replied that they had not tried taking stereoscopic pictures with this table, but probably an apparatus could be fixed to the table without much difficulty.

Papilloma of the Renal Pelvis.—Dr. J. F. McCarthy reported six cases of papillary new growths of the renal pelvis, with accompanying photomicrographs and specimens. One case was of the papillomatous variety, four were of the papillary carcinomatous type, and the sixth case of the solid cancer type. The conclusions drawn by the author were to the effect that from the viewpoint of symptomatology, pain and hematuria were not characteristic. As diagnostic aids, sudden and profuse hemorrhage on the introduction of a ureteral catheter should not be overlooked. Hydronephrosis with a history of hematuria and negative x ray findings might be considered as suggestive of pelvic growth. Hematonephrosis is also to be regarded as of significance in this connection. One should be suspicious of papillomata encircling the ureteral mouth, especially if seen emerging from within the ureter, and hematuria on one side with an albuminuria on the opposite side. Ureteropyelography should be practised, but only with media suitable for intravenous medication, such as sodium bromide, and without coloring matter or other foreign substance. When diagnosed, nephroureterectomy was the rule regardless of the nature of the growth. Methodical cystoscopic observation of these cases over a period of months or years, postoperative, should constitute a routine practice, together with dietetic survey and continued supervision.

Prostatectomy with Unusual Blood Picture.—Dr. McCarthy also reported a case of prostatic hypertrophy showing marked urinary retention and an exceedingly high blood chemistry retention. The prostate was not unusually enlarged, there being but a moderate degree of hypertrophy which was disproportionate to the amount of residual urine, some forty ounces being present at the time of first examination. At the time of preliminary cystotomy, January 19, 1921, creatinine was 11.1; blood urea 111; phthalein elimination, with no trace after intravenous administration. Prostatectomy was performed on March 25, 1921. In the intervening period of over two months, constant suprapubic drainage was carried on. Patients' condition on February 12, 1922, revealed the fact that he had gained forty pounds; creatinine 4.1; blood urea 38.6; blood pressure 158-120; and save for slight dyspnea and moderate pallor, the patient's condition showed a remarkable improvement.

In the discussion, Dr. McCarthy stated that pyelograms were made of two of the patients, in both of which new growths of the pelvis were suspected and a definite diagnosis made in one. Another was exceedingly intolerant to instrumentation. Pyelography, therefore, was not feasible in this case. He said he fully concurred in the value of pyelography as a diagnostic aid, but stated that one should be very careful in applying it in pronounced hematurias. He indicated that when pyelography was to be employed in these cases, one should use such preparations as were suitable for intravenous administration, and as stated in his report, free of coloring matter or other foreign substance.

Dr. Abraham Hyman said that papilloma of the renal pelvis was rather uncommon, and to have a half dozen cases reported in one evening was very unusual and extremely interesting.

Dr. W. F. Braasch, of Rochester, Minn., said that certainly a very small proportion of cases of hematonephrosis were caused by papilloma of the kidney pelvis. However, out of twelve cases with papilloma of the renal pelvis he had observed two or three with hematonephrosis. In fact, he believed that Dr. McCarthy was right in saying that in every case of hematonephrosis one must consider the possibility of papilloma of the renal pelvis as a factor. Dr. McCarthy was to be congratulated on the unusual series of kidneys with renal papillomata which he had presented in one evening.

Dr. Edward L. Keyes, Jr., also complimented Dr. McCarthy, and said that the case of prostatectomy with the unusual blood picture was a record one, far beyond any in his own experience. He had once discovered in the ward a patient with five mg. of creatinine in the blood. This patient had come in late the preceding night with stricture retention, and the perineum had been cut at once to relieve retention. The patient looked perfectly well in spite of his high blood retention. But the next day he went into coma and the following day he died.

The series of cases of papilloma of the pelvis was very interesting, but why were not pyelograms made? Also, he wished to protest against the suggestion that hydronephrosis with hematuria was suggestive of papilloma of the kidney pelvis. Dr. Keyes said he had several times seen this clinical combination, but never in a case of the pelvis.

Dr. **Edwin E. Beer** said he considered it quite remarkable to hear of so many cases of papillomata of the kidney pelvis in one evening. Dr. Braasch had added fifteen to Dr. McCarthy's six, making a total of twenty-one. In going over the whole subject for a year he had found only 170 cases in all. Evidently a great many cases were not reported in the literature. In his own service at the hospital he had seen only five. One was a primary papilloma of the ureter, and the other four had ureter or bladder complications starting in the pelvis.

Referring to the question of pyelography, he cited a case in which a patient with hematuria was cystoscoped. It was decided to be a left hematuria, and a pyelogram showed a slightly enlarged pelvis. It could not be decided that there was a retropelvic mass. At operation a chronic interstitial kidney was found. A specimen was removed and the kidney dropped back, and the report was chronic nephritis. The same condition was found on the other side. The patient recovered from the operation and left the hospital, but bled badly off and on. A year later he returned and a second operation was performed by Dr. Hyman, and a practically inoperable carcinoma of the pelvis was found. His own five cases and the others reported made a total of twenty-six cases which had not appeared in the literature at all up to date. So far as the procedure was concerned, he had never seen a patient recover who had a high creatinin content; eight was as high as he had ever seen.

Dr. **Beer** called attention to the fact that it was very remarkable to hear of so many cases of tumors of the kidney pelvis and ureters reported at one meeting, all cases, apparently, that, as yet, had not been included in the literature. In going over the subject about a year ago, the latest reviews had collected about one hundred and seventy cases of benign and malignant tumors of the ureters and kidney pelvis. Dr. McCarthy had added six more, Dr. Braasch another fifteen, and Dr. Beer could add five more from his service at Mt. Sinai Hospital; in other words, to the already one hundred and seventy cases, add at least twenty-six new ones.

In connection with the case with a high creatinin content in the blood reported by Dr. McCarthy, Dr. Beer did not believe he had ever seen a patient recover in which the figures reached higher than eight. In this type of case, a preliminary use of an idwelling catheter with gradual emptying of the bladder, Dr. Beer believed to be a proper means of preparing a patient rather than a immediate suprapubic cystotomy, which upset the pressure conditions too rapidly within the bladder, ureters and kidneys. Dr. McCarthy was to be congratulated upon the successful issue in this particular case.

Dr. Heitz-Boyer, of Paris, was prevailed upon to give his experience in pyelography in renal and ureteral conditions. He also called attention to the fact that though he had had much experience, even with ureterography and pyelography diagnosis of tumors within the pelvis was not a simple procedure, and to emphasize that fact, he cited and demonstrated on the board the case of a young girl whose output was only 220 c. c. in twenty-four hours due to reflex inhibition from the kidney which was involved. At the first cystoscopy, an obstruction was found in the right ureter at two to three cm., which, after considerable manipulation, was passed and bloody urine was obtained from the ureter as well as the kidney pelvis. At the second examination, he passed the catheter to the obstruction but could not get beyond it. At the third examination, he observed that on filling the kidney and ureter there were definite gaps or filling defects both by radioscopy and radiography. There were definite areas in the ureter and pelvis where the bromide solution failed to give a definite outline, and others where both in the ureter and particularly in the pelvis the bromide gave a definite picture. With these findings, which were submitted to Legueu, Marion, and others, the diagnosis of tumor in the pelvis with secondary implants in the ureter was made. On operation, he found a rather atypical type of tuberculosis of the kidney, but examination of the pelvis gave him no clue to the incomplete filling nor did he find anything in the upper ureter to explain shadow defects. He did think that perhaps clots might have interfered with the proper filling of the ureter and pelvis, but such clots were not seen. The patient made a satisfactory recovery and the urine output after nephrectomy, that removed all reflex inhibition, rose to over one thousand c. c., whereas previous to operation there had been a marked oliguria of approximately two hundred c. c. This case illustrated very well the difficulties in interpretation which the other speakers had emphasized.

Traumatic Stricture Treated by Pasteau's Operation.—Dr. E. L. Keyes, Jr., presented the following case: C. W., aged twenty-eight, brakeman, unmarried, on February 17, 1920, was crushed between a locomotive and a railroad platform, sustaining a fracture of the pelvis. The immediate disturbance to urination was not great, but from then on he had increased difficulty in passing water, and finally incontinence from overflow. On May 18, 1920, perineal section was done in Jersey City, but it was found impossible to get into the bladder and suprapubic cystotomy and retrograde urethotomy were therefore performed. On August 25, 1920, he entered Dr. Keyes's service at St. Vincent's Hospital with the perineal stricture again recontracted, dribbling urine, and no instrument could be passed into the bladder. The bladder was accordingly immediately drained by suprapubic cystotomy under local anesthesia.

On September 8, 1920, the Pasteau operation was performed. A sound was introduced through the cystotomy wound into the posterior urethra, and made to project into the perineum; the anterior urethra was also distended with a sound; and that section of scar which intervened between the two instruments was completely cut away. The section thus removed involved the deeper portion of the membranous urethra, and the outer portion of the prostatic urethra. This resulted in dividing the urethra into two sections, of which the extremities were brought forward into the perineum and sutured to its skin. The anterior extremity, corresponding to the bulbous urethra, was readily loosened up, widely split, and sutured into the perineal skin. But the posterior section was of course relatively immobile, and the skin had to be turned in to meet it even approximately. A large perineal tube was introduced. On September 28, 1920, the posterior urethral segment proving irregular, a grooved director was introduced into the bladder and the urethra cut with a scalpel. A large perineal tube was reintroduced. At that time the anterior orifice was healed and readily took a 30 F. sound from the normal meatus to the perineal meatus. The bladder wound healed a few days after this operation.

On November 29, 1920, catheterization and sounding of the posterior orifice having been kept up and the scar still showing a tendency to recontract, the posterior urethra was once again cut with the Otis urethrotome, this time to 34 F. On December 29, 1920, the patient went home, recontraction having been controlled by the use of the straight Kollmann dilator and the scar tissue seemed soft.

Since that time the posterior urethra had been sounded in the Out Patient Department, the anterior urethra requiring no dilatation. A band of scar, which would doubtless form a ridge on the urethral roof when the final operation was performed, had recently been cut. Latterly, however, he had gone as long as five months without dilatation, and at the end of that time a 29 F. bougie slipped readily into the posterior urethra. It therefore seemed that he had now come to the point where his two perineal sections of the urethra could be joined by the second stage of the Pasteau operation which consisted of sinking this perineal slip of skin between the two meatus and closing the perineum over it. This would be done and the patient was shown for comparison at the present time.

Dr. Keyes also showed a specimen illustrating acute suppurating nephritis, due to injection of air into the fascia about the kidney (Carelli). He also called attention to a reported death by air embolism, following the use of this diagnostic method.

Pyelography With an Improved Medium.—Dr. S. R. Woodruff gave a lantern slide demonstration of pyelography.

Genitourinary Cases.—Dr. Clarence G. Bandler reported a case of renal tuberculosis in a child aged eleven years. A right nephrectomy was performed and fourteen months after the operation the urine showed no evidence of pus or blood and the boy was in good health. Dr. Bandler also reported a case of bilateral nephrolithiasis in an Italian aged thirty-nine years. In this case, contrary to the usual operative procedure, the patient was greatly benefitted by operation on the more badly damaged kidney first.

Pathological Complications With Duplication of the Renal Pelvis and Ureter (Double Kidney). William F. Braasch and Albert J. Scholl, Jr., of the Mayo Clinic, Rochester, Minn., in a review of the records of 144 patients observed at the Mayo Clinic since 1907, in whom duplication of the pelvis and ureter was found, revealed that 135 (ninety-four per cent.) had unilateral duplication and nine (six per cent.) had bilateral duplication; in forty-four cases the duplication was complete; in one hundred cases incomplete. There was usually a difference in the size of the pelves of a double kidney, the upper pelvis being the smaller. In spite of this the function of the two segments was usually equal. Microscopically the tissue between the two segments was demonstrated to be a complete histological unit. In some cases the capsule dipped into the renal mass, making a definite partial division. In the specimens examined glomeruli and renal tubules were almost always found in the parenchyma between the two pelves.

The diagnosis of complete duplication by cystoscopic examination is comparatively easy. In incomplete duplication, however, the condition was discovered only by means of a routine pyeloureterogram. The cystoscopist should always be on the lookout for the third opening. When three ureters existed the usual method of catheterization by removing the cystoscope and reintroducing it was awkward and painful. The authors had devised a three way catheterizing guide which overcame this. It was difficult to estimate the definite function of each of the two segments, particularly if one was diseased. Unless good function could be demonstrated in one segment a heminephrectomy was out of the question. Pyelography was of value in determining the distance separating the two pelves, as well as the pathological condition present. The clinical distinction between the small pelvis of atrophic pyelonephritis and the upper pelvis seen in duplication might be difficult, owing to pathological complications.

Dr. S. R. Woodruff inquired further into the matter of the routine urological examinations, and said that from the viewpoint of these conditions pyelography was the usual method of diagnosis, and that those who did not employ pyelography were rather working in the dark. That point had been brought to his attention on account of two cases seen within the past year. He had been very enthusiastic over pyelography for a long time, but his enthusiasm had ebbed and flowed with the results obtained. At the present time, however, with the media now employed, it hardly seemed to be considered.

He then cited three cases seen last year—one of real double kidney and stone in the lower pelvis, now with a stone again in the lower pelvis, a recurrence from last June, despite all treatment given to prevent it. The other two were cases of diseased kidney in one of which operation had been performed for a diseased gallbladder by a surgeon who found what he believed to be a cystic kidney. He closed up the wound and left the kidney mass sutured into the peritoneum, having let the fluid out. That patient was cystoscoped, and the ureters which were in the usual position were catheterized; no output was obtained from one side and sufficient from the other to suggest a hydronephrotic kidney. At operation the patient was found to have a large horseshoe kidney, one end of which was hydronephrotic. In that case a heminephrectomy was necessarily the operation, and this was successfully performed, but it was mortifying not to have made the diagnosis.

The third patient was a large, corpulent man who was cystoscoped and showed all the symptoms of hydronephrosis. Renal functional test showed 0 per cent. in one half hour from right side and 35 per cent. from left. He refused operation and left the hospital the next day, went home, and came back again. We could not keep him long enough to do anything with him, but finally succeeded in getting him on the table and found a probable hydronephrosis of the kidney, but could not reach the right renal pelvis, wherever it was. Had a pyelogram been taken it could probably have been approached with ease. A few days later the man passed two or three stones, and the case may be considered cured at the present time. In this case both ureteral orifices were in their normal positions.

Dr. Braasch, referring to the incidence of double kidney, said that it would be very difficult to get the actual incidence of this condition. It undoubtedly occurred more frequently than it was found in the course of routine cystoscopy, for it would not be found unless one looked for it. Most observers were satisfied with finding two meatus, but a third should always be looked for. Anomalies of the urinary tract occurred very frequently. In 1912 he said he reported a review of 171 successive autopsies made at the Mayo Clinic in which congenital anomaly was found in seven cases, or over four per cent. of the total. Of this number only two had duplication of the kidney. It was difficult, he said, to arrive at the actual percentage of recurrence of this anomaly without a large series of postmortem examinations when particular search was made for the existence of such anomaly. The fact that the lower ureter nearly always originated from the upper pelvis was first observed by Weigert in 1878, and was known as Weigert's law. Mertz had made a valuable résumé of the literature of this subject, to which he would refer anyone who was interested.

Referring to the diagnosis of duplication, a complete duplication of the pelvis and ureter was very easy to diagnose, but the incomplete duplications depended entirely on routine pyelography for their diagnosis. In every case where one could not make the exact diagnosis the employment of pyelography was justified. At the Mayo Clinic sodium bromide was used as the injected medium. The secret of preventing trouble after pyelography was to be sure that there was no retention of the medium injected. It was necessary to get every bit of it out. The only cases where there had been any trouble was where the medium had been retained in the pelvis and not drained out. The patient would have trouble with any medium that was allowed to remain in the pelvis. It was essential to have drainage or there would be trouble. If there was any possibility of retention it was advisable to drain the pelvis after twenty-four or forty-eight hours with a ureteral catheter, and if that was not possible it was advisable to go in and take the kidney out. Don't let the patient suffer for two or three days with evident retention. But if the kidney was carefully drained and washed out after pyelography, and if the pelvis was not overdistended, and if the medium injected was freshly sterilized, there was no reason why there should be trouble. Always be sure first that there was another kidney functioning on the other side before pyelography.

The series of 144 patients were divided into four groups. Pathological complications other than lithiasis with double kidney in most instances required nephrectomy.

Dr. Lewald said that the radiographs presented by Dr. Braasch were remarkable; he had seen nothing that approached them. He had had a very modest experience of a few cases of double ureters, and knew that Dr. Braasch had a large collection of them, but had never before seen it demonstrated in its entirety, and he felt greatly indebted for the opportunity of seeing it.

Dr. Lewald said that in a postmortem experience of five thousand autopsies he had found comparatively few double ureters or other anomalities of the urinary tract, except horseshoe kidney. This was probably due to the fact that in the ordinary autopsy procedure one might easily overlook a double ureter.

Dr. Keyes said that the encyclopedic paper of Dr. Braasch ought not to be desecrated by amateur discussion, but there were a few points on which he would like a little more enlightenment. In the early part of the paper he understood the speaker to say something about the displacement of ureteral orifices from horseshoe and fused kidneys, but in his experience such kidneys usually had normally placed ureter orifices.

Dr. Braasch responded that horseshoe kidneys were apt to have abnormal meatus; in the usual double kidney normal meatus was the rule.

Dr. Keyes said that in the second place Dr. Braasch made the statement that the clinic showed up a greater proportion of these double ureters than were shown in anatomical statistics, because these kidneys were so liable to disease. He agreed with the statement that these malformed kidneys were particularly liable to disease, but recently he had seen some figures on reduplication of the kidney and pelvis, bringing it up to a definite one per cent. of all cases. That was more frequent than was usually seen. Furthermore, it seemed certain that a number of complete duplications must have been overlooked, and we surely overlook many incomplete reduplications.

Dr. McCarthy asked if Dr. Braasch found in the duplicated ureters that the lower always went to the upper pelvis.

Dr. Braasch replied that he did not think they did. He did not recall all the cases, but there were a number where the contrary was found.

Dr. McCarthy said that they had six or seven cases where the lower ureters went to the upper orifice. Some years ago he saw one case with three ureteral calculi in the lower ureter, and six months later a double ureter was found on that side. Referring to Dr. Braasch's statement that all patients were given a routine differential phthalein test, Dr. McCarthy asked with what time Dr. Braasch was satisfied.

Dr. Braasch replied that they were not satisfied with less than thirty minutes, but as a routine it was usually made at fifteen, and he thought that was perfectly safe, providing the ureteral catheters were draining.

Dr. A. R. Stevens asked whether Dr. Braasch and Dr. Keyes had come across the work of Kerr, who had dissected 100 cases, looking for anomalies, and had found four complete reduplications, giving the impression that that condition was more frequent than had been noted clinically. Continuing along the line suggested by Dr. McCarthy, Dr. Stevens said that Huntington brought out the point that the lower ureter usually went to the upper pole, but laid more emphasis on the fact that the opening which went from the normal site in the trigon was connected with the pelvis of the lower pole of the kidney.

Abstracts from Current Literature

GENITOURINARY DISEASES.

Prostatic Lymph Node Hyperplasia.—Nobuyuki Fukase (*Surgery, Gynecology and Obstetrics,* August, 1922) states that small, primitive, or rudimentary lymph nodes occur normally throughout the prostate in the form of very small aggregations of lymphocytes located beneath the glandular and duct epithelium, most marked toward the outlets of the ducts. They are analogous to the rudimentary lymph nodes found in other organs, such as the liver, kidneys, and uterus. Hyperplasia of these rudimentary lymph nodes of the prostate occurs chiefly in chronic hyperplastic prostatitis and in primary carcinoma of the prostate. In both conditions, the hyperplasia is essentially an inflammatory one due to chronic infection, or irritation, and possesses the same significance that such hyperplasias have in other parts of the body. In the absence of chronic inflammation, a hyperplasia of the primitive lymph nodes of the prostate occurs in the lymphatic constitution, and may be found also in other generalized diseases of the lymphoid system, as Hodgkin's disease, lymphocytoma, and leucemia. In both the inflammatory and noninflammatory hyperplasias well developed germinal centres may be produced in the hyperplastic node. Other evidences of functional activity by these hyperplastic nodes are shown in the metastasis of pigment, tubercle bacilli, and carcinoma cells to them.

Bacillus Coli Infection of the Urine.—William Hale-White (*Lancet,* June 24, 1922) reports a case of a woman, fifty years old, who for many years suffered from attacks that were believed to be due to cystitis and consisted of painful and frequent micturition, lasting two or three days. Recently the attacks became aggravated, the temperature rose and the urine was thick. The right side of the abdomen was rigid and the kidney outline was distinctly palpable and tender. The urine was turbid and contained albumin, had a foul, fishy odor, and contained blood on several occasions. Bacillus coli pyelitis was diagnosed and the urine yielded a culture of Bacillus coli but no casts nor epithelium. On prescribing bed rest, plenty of fluids, a milk and farinaceous diet and an autogenous vaccine once a week. hexamethylenamine three times daily and sodium phosphate at intervals, she improved considerably but had a relapse from which she finally recovered. Bromide and hyoscyamus mixtures were given for insomnia and morphine for severe cases. It was a case of Bacillus coli septicemia.

The greater frequency of this disease in females and the more frequent involvement of the right kidney are difficult to explain. The pelvis of the kidney is affected most. An ascending infection traveling from the anus and up the urethra and the rest of the urinary tract can be practically excluded; a communication between the lymphatics around the kidney and those around the colon may be an etiologic factor. A blood stream infection does not explain the more frequent involvement of the right side. Consequently no theory known at present explains all the peculiarities of this disease. Bacteriologically, colon bacilli were found in the urine of patients, mostly women, who were not acutely ill from other diseases, but they were found in the urines of patients afflicted with acute pneumonia, typhoid fever and tuberculous peritonitis; their presence, however, was not always associated with urinary symptoms. There are two groups of symptoms: 1, those due to general infection, and 2, those due to urinary infection, each group showing a varying intensity. The duration of the disease varies from a few days to a few weeks and relapses usually recur, but ultimate recovery is the rule; but even then the bacilli persist in the urine. This disease is common in young children, nearly always in little girls; it also occurs frequently in pregnant women, but it is rarely fatal and usually does not interfere with the pregnancy. It should be differentiated from perirenal abscess, cystitis, lumbago, renal calculus, gallstones, phthisis, meningitis, malignant endocarditis and other conditions. The Bacillus coli infection of the urine always tells the story.

Treatment of Gonorrheal Complications with Mirion.—Stephen Robert Brünauer (*Wiener klinische Wochenschrift,* May 18, 1922) asserts that the great advantage of mirion over other remedies lies in the fact that, on the one hand, the molecular iodine is split up easily and in considerable amounts, probably even quantitatively, within the body, and on the other hand, the difference between the storing up of iodine in normal and pathologically changed tissues is marked. If the ability to influence inflammatory infiltrations in gonorrheal complications by reactionary inflammation, as a result of the anchoring of the iodine in the tissues, is given, the use of mirion makes it possible to bring the iodine close to any existing gonococcal foci, which are difficult to reach and lie deeply, and in this way possibly to destroy the gonococci themselves with the iodine. Thirty-five cases of gonorrheal complications, in which healing was incomplete, although in many of these cases vaccine and proteotherapy were given, were treated with injections of mirion.

Mirion is indicated in subacute, but not in fresh or old cases of gonorrheal complications. Very old cases with cicatricial healing remain uninfluenced and it is contraindicated in very early cases, especially those with distinctly visible involvement of the adjoining tissues (tunica vaginalis, etc.). In acute cases, a short antiphlogistic local therapy was followed by a few injections of vaccine, which were then followed by several intragluteal injections of five c. c. of mirion given every two days. In subacute cases, which had received some vaccine milk, or aolan injections, and especially those which had failed to respond more or less completely, mirion was used immediately. Symptoms of iodism were not encountered. In a number of cases, the first and second glasses of urine cleared up and in one case the gonococci could not be demonstrated. That the therapeutic effect observed is to be attributed to mirion, is shown by the fact that there was a response to mirion after all other therapeutic measures had failed.

Nontuberculous Kidney.—R. P. Sullivan (*Annals of Surgery,* April, 1922) asserts that the kidney is the eliminating organ for circulating microbes, and in the course of this elimination may itself be damaged in a variety of ways. Hematogenous infection may be restricted not only to a single kidney, but even to a circumscribed portion of the organ. The source of the infection may not only be a general disease, but a distant and apparently insignificant focus may be responsible. Metastatic hematogenous infection of the kidney, perinephritic or paranephritic abscess, is not always easily recognized, and may be confused with intraabdominal infections. A sudden attack of pain in the kidney region associated with fever in a patient known to have a suppurative process elsewhere in the body should excite suspicion of metastatic kidney infection. Cystoscopy and pyelography are valuable aids especially when urinary changes are incomplete, or the symptoms are referred to the healthy side. The treatment of perinephritic or paranephritic abscess is early drainage. Where the suppuration involves the kidney parenchyma, or where the process is an acute fulminating one, nephrectomy is indicated.

Febrile Stages in Chronic Nephritis.—J. Oscar Ritchey (*American Journal of the Medical Sciences,* June, 1922) has observed that during febrile elevations, due either to infection or some other agent, there is a noticeable and often measurable depression in renal function. A great majority of all cases of chronic nephritis manifest temperature elevations at times throughout the course, and in this disease fever with an associated increase in albuminuria shows an added acute process. While function is not consistently depressed in acute infectious fever, it is during these febrile reactions. In chronic nephritis, as shown by fever with simultaneous untoward clinical symptoms and functional impairment as measured by phthalein excretion, urea and creatinin retention and signs of renal irritation as determined by albuminuria and sediment increase, there are superimposed acute processes, and he suggests that the course of chronic nephritis is determined by these added acute processes, and that the prognosis depends in large measure upon their cessation or continuation.

Influence of Rigid Salt Restriction in the Diet in Chronic Nephritis. — James S. McLester (*American Journal of the Medical Sciences,* June, 1922) is inclined to think that the almost complete elimination of chlorides from the diet of patients with nephritis and vascular hypertension accomplishes little if anything more than does the salt poor diet ordinarily prescribed. He found that salt free diet was unappetizing to the patient, who ate but little, a factor which must not be disregarded. The blood urea instead of decreasing showed a tendency to increase. The blood chlorides, irrespective of diet, varied but little; while the urine chlorides, reflecting the degree of the patient's adherence to the diet, fell to a very low figure. The systolic pressure, as a rule, showed a moderate but never marked fall. Two of the patients observed developed weakness and prostration to a distressing degree, and one patient experienced retinal hemorrhages and other fundus changes after two weeks of this diet.

Chronic Acid Nephritis.—Ralph H. Major (*Bulletin of the Johns Hopkins Hospital,* February, 1922) presents these observations as a contribution to the subject of kidney pathology, and particularly for comparison with the numerous studies in the literature on experimental chromate nephritis. The patient, suffering from an inoperable carcinoma of the face, which had been treated by the application of chromic acid crystals, lived for four weeks after the development of the nephritis. The kidney lesion was that of a pure tubular nephritis. Clinically no edema was noted, and no anasarca or ascites was present at autopsy, nor were symptoms of uremia present. A study of the urine showed that its output, following a temporary depression, was high, but the urine itself was of low specific gravity, and the excretion of nitrogen, chlorides, phosphate, creatinin, uric acid and urea were markedly diminished. Glycosuria was present from time to time, but bore no apparent relationship to the amounts of blood sugar present. The blood chemistry showed very high values of urea, inorganic phosphates, amino acids, and creatinin and values higher than normal for uric acid. The carbon dioxide content of the blood plasma showed definite evidence of acidosis which responded promptly to alkali therapy.

Symptomless Hematuria.—Arthur H. Burgess (*British Medical Journal,* May 20, 1922) in one hundred cases of symptomless hematuria found villous papilloma present in forty-one cases, malignant growths in eighteen, enlarged prostate in three, and one each of ulceration from a suture following colporrhaphy, socalled mucous ulcer and calculus fixed in a postprostate pouch, making a total of sixty-five cases of vesical origin; in thirty-five cases of renal origin he found fourteen cases in which the cause was underterminable, nine malignant growths (including hypernephroma), two papillomas and one angioma of the renal pelvis, three cases of renal calculus, one congenital cystic disease, one chronic nephritis with small cysts, two mobile kidneys and two essential hematurias. The new growths were found to preponderate: forty-four were benign and twenty-seven were malignant.

The term essential hematuria refers to renal hemorrhage, the etiology of which cannot be determined by any existing methods of urological investigation. In the clinical study of these cases, blood corpuscles must be demonstrable microscopically, general diseases causing hematuria must be excluded and also the passive congestion of heart disease. The further investigation includes, first, the source of the hemorrhage, whether vesical or renal, and whether unilateral or bilateral; second, the nature of the lesion; and third, the functional condition of the rest of the urinary tract. The physical characters of the blood alone are not reliable. Cystoscopy alone can determine the source of hemorrhage and should always be done, especially in the active stage of the hemorrhage, when the ureteral orifice gives the decisive information. When the blood is seen to come from one ureter, the pathological lesion of the corresponding kidney must be determined by careful palpation of the loin, a chemical, microscopical and bacteriological examination of the mixed urine and separate urines after ureteral catheterization, radiography and pyelography; if these fail, exploratory nephrotomy is indicated after investigating the functional capacity of the opposite kidney with the indigocarmine test. If no microscopic lesion is found, a biopsy on the kidney tissue may be done. In all cases of symptomless hematuria, the patient rather than the hemorrhage should be treated, and the hemorrhage should not be arrested until it has been traced to its source by cystoscopy.

Formation of Iodoform in the Bladder Mucosa from Potassium Permanganate.—Karl Preis (*Wiener klinische Wochenschrift,* June 22, 1922) states that if an empty bladder of a patient taking potassium iodide is irrigated with a one to four thousand solution of potassium permanganate, an odor of iodoform becomes marked. The urine does not give this reaction but it occurs only from the iodine combinations taking place in the bladder mucosa. The author treats chancres with tincture of iodine and a ten per cent. solution of potassium hydroxide, from which iodoform is generated.

Hydronephrosis Due to Aberrant Renal Artery.—E. C. Bevers (*British Medical Journal,* May 6, 1922) reports a case of hydronephrosis apparently due directly to an aberrant renal artery. An operation consisting simply of division of the abnormal vessel caused the symptoms to disappear entirely. Whenever no cause can be found to explain the pain, simple decapsulation effects a cure, so that an exploratory operation is always justifiable in cases of continued renal pain without obvious cause. The artery in the case reported was no doubt the cause of the hydronephrosis as the dilatation extended only to the point where the vessel crossed behind the ureter.

Abscess of Prostate.—H. L. Kretschmer (*Surgery, Gynecology and Obstetrics,* March, 1921) states that abscess of the prostate occurs more frequently than is generally recognized. Infected abscess cavities, which drain poorly and have ruptured into the urethra, may occasionally be factors in keeping up a chronic urethral discharge, or may lead to recurring exacerbations of acute prostatitis. Nongonorrheal abscess is not an uncommon occurrence. Early surgical intervention—namely, incision and drainage, is a rational method of handling these cases and does not differ from the surgical treatment of abscess occurring in other organs. Operative treatment doubtless shortens the duration of the disease.

Simple Conservative Treatment of Suppurative Batholinitis with a Patent Excretory Duct.—H. Weitgasser (*Wiener klinische Wochenschrift,* April 27, 1922) recommends the following technic in these cases: After thoroughly expressing the pus from the gland, a paste consisting of choleval 2.5, cetacei 15.0, olei olivarum 30.0, is slowly injected by means of a Pravaz syringe (warmed in hot water to keep the paste fluid) with an Anel, blunt, bent needle through the excretory duct in amounts of 0.1 to 0.2 gm. These injections are given several times at intervals of three to five days, according to the microscopic findings. This procedure is almost painless and the results in nine cases were excellent. The results are believed to be attained as follows: the injected mass changes its paste oily consistency only slightly as a result of the body temperature and a partial closure of the duct results, but not tight enough to produce retention or cyst or abscess formation; the oil and wax are absorbed within a few days, or they melt and escape and as a result of the protracted stay of the choleval, a lasting effect of this remedy on the epithelium with the gonococci is obtained.

Complement Fixation in Gonorrhea.—T. E. Osmond (*Lancet,* June 10, 1922) asserts that the complement fixation test in gonorrhea has not received the recognition it deserves and that its diagnostic value is at least as great as that of the Wassermann reaction in syphilis. The reaction becomes positive earlier in this disease than does the Wassermann reaction in syphilis and it does not tend to disappear as a result of treatment until some time after the disease is cured. It is particularly useful in women, as diagnosis by other means may be uncertain. The conclusions drawn from a series of one thousand cases are as follows: 1, the early stage at which a positive result may be obtained; 2, the relatively high percentage of positive results in undoubted cases of active gonorrhea, averaging 86.5 per cent.; 3, the very low incidence of "false positives"—only three in a thousand; in none of these cases could gonorrhea be absolutely excluded; and 4, a "doubtful" test is at least suspicious and should be repeated and stimulate to further careful examinations.

Cancer of Prostate.—Herman C. Bumpus (*Surgery, Gynecology and Obstetrics,* August, 1922) concludes that: The results obtained thus far by radium in the treatment of cancer of the prostate are inferior to those obtained by surgery. The new methods of radium application indicate that in the future the results of the two methods will be the same. Partial prostatectomy in cases of carcinoma occasionally proves to be a curative rather than a palliative procedure. A combination of radium and surgery offers the best results.

Removal of Cancer of Prostate.—George Walker (*Annals of Surgery,* May, 1921) gives the following technic for symphysiotomy as an aid to the removal of cancer of the prostate:

1. Expose the bladder in the same manner as is done in an ordinary suprapubic operation . 2. Open the bladder to confirm the diagnosis, and to ascertain the extent of the invasion of the vesical neck. 3. Divide the symphysis, pubic ligaments and attachment of the triangular ligament. 4. Abduct the leg slightly; this procedure separates the cut ends of the bones. It will be found that an abduction of about six inches makes a separation of from one and a half to two inches. 5. Divide the bladder transversely near the vesical neck. The incision through the wall should be as near the prostate as the growth will allow. 6. After the bladder has been completely divided posteriorly the seminal vesicles will be exposed; these are then ligated and cut. 7. The urethra is now cut across at its junction with the prostate. 8. Separate the prostate carefully from the surrounding structures. Expose the inferior vesical artery and the branch of the superior vesical artery and ligate them. Continue the enucleation until the gland is free, so that

it can be removed. 9. Make an opening through the perineum for drainage. 10. Close the posterior three fourths of the bladder wound leaving a small opening at the anterior angle for the connection of the urethra to the bladder, then suture cut end of the urethra to the opening left in the bladder. 11. Close the symphysis with heavy silver wire. 12. Place the proper drains and close the wound. The experience of obstetricians is that the bones after pubic pubiotomy quickly unite by fibrous union, and the patient is able to walk within a short time.

Cancer of Bladder.—William F. Lower (*Annals of Surgery,* September, 1922) states that the following conclusions are drawn from the available data of cases reported in the literature in this country and from his own series: A large percentage of the malignant cases are of papillary origin, which means that they were referred late to the surgeon. The percentage of recurrence is great whatever the method of operation, whether excision of cauterization. Recurrence is no contraindication for treatment, as some of the best results have resulted from operation on cases with recurrences. Repeated observation after operation is absolutely essential if the mortality of carcinoma of the bladder is to be reduced. The good results are due to the fact that recurrences are local and seldom metastasize.

Malignancy of Bladder.—A. J. Scholl (*Annals Surgery,* March, 1922) states that exstrophied bladders that are subject to constant irritation and trauma have an extensive glandular covering, the result either of metaplasia from the normal covering or of hyperplasia of glands in the mucosa. Such glandular structure often shows characteristics approximating malignancy. In nine cases of exstrophied bladder, in which material for histological study was available, two were definitely malignant, and two showed atypical cellular formation varying markedly from the normal. In the reported cases of malignancy of exstrophied bladders, which are relatively frequent, the growths were adenocarcinomas.

Syphilis in General Practice.—D'Arcy Power (*Lancet,* May 27, 1922) speaks of the occasional difficulty of diagnosis encountered in obscure cases, which necessitate a diagnosis by operation or otherwise. Syphilis presents two peculiarities, first, long periods of latency when the patient appears to be in perfect health, and second, its transmission to the second generation. Syphilitic orchitis may occur in very old men who show no other evidence of the disease, the enlargement being often mistaken for a malignancy. In these cases it is always well to do a Wassermann test and the therapeutic test with mercury and iodides. Syphilis is sometimes overlooked, even though obvious, as when it occurs in young, unmarried girls who could not possibly contract the disease in the ordinary way, as from a scratch. It may be mistaken for tuberculosis. A speedy lymphadenitis is an early sign of nonvenereal syphilis.

Too much reliance should not be placed on the entire absence of any history of infection, which may be due to real ignorance of the patient or to insignificance of the lesion. The chancre need not necessarily be indurated, but it may be a simple pimple or abrasion, the induration being the result of treatment and secondary infection. Sometimes the inexpediency of questioning the parents as to any venereal infection leads to the overlooking of a case of syphilis, but an operation and an antileutic therapy may clear up the diagnosis.

There may be a prolonged latency of symptoms, generally in connection with inherited syphilis, as where the patient had no stigmata, has married and has had healthy children, or, in the acquired disease, many years may have elapsed since the patient had any signs. In both cases increasing age or a slight injury appears to be the determining cause of a syphilitic manifestation. Syphilis may also have a modifying effect on other forms of infective inflammation, whether it be tuberculous, phagedenic, streptococcal, or staphylococcal. The possibility of a syphilitic factor should always be borne in mind in obscure and chronic inflammations that do not respond to ordinary methods of treatment.

Bismuth in Syphilis.—C. Simon and J. Bralez (*Bulletin Médical,* June 21 and 24, 1922) report on 113 case of syphilis treated with the new insoluble salts of bismuth. No serious untoward effects of the drug were observed, and in one patient who had been intolerant to even minute doses of the other antisyphilitic remedies bismuth was used with complete success. Two injections a week, each of twenty centigrams, were found to be the proper dose of the bismuth salts, large amounts tending to induce stomatitis without increasing the therapeutic results. In seven cases of chancre, the spirochetes disappeared from the lesion, on an average, in three days and after 1.3 injections. Healing of the chancre took place, on an average, in thirteen days and after four injections. In thirteen case of secondary syphilis in which examinations for the spirochetes could be carried out, they disappeared, on an average, in 4.4 days and after 1.7 injections. Epidermization of mucous membranes occurred in 9.5 days and after 2.9 injections, but complete objective healing required 11.2 days and 3.7 injections. Skin lesions were more resistant, requiring 22.1 days and 5.6 injections. Glandular enlargements persisted a long time after disappearance of the surface lesions. On the whole, the action of bismuth on the primary and secondary manifestations appeared to be much superior to that of mercury and comparable to that of arsenobenzol in large doses. A case of tertiary diffuse syphiloma of the nasal septum with perforation and sequestration underwent complete healing in six weeks, after six injections. Headache in syphilitics generally passed off after a single injection and vertigo, with or without the presence of tabetic manifestations, likewise disappeared under the treatment. Incontinence of urine and pain in tabetics were markedly influenced by bismuth therapy. In a case of brain syphilis superimposed upon tabes of long standing, most remarkable mental and physical improvement was observed after seven bismuth injections. In a case of probable incipient paresis, speech and memory were temporarily improved. Bismuth appears to act more slowly on the Bordet-Wassermann reaction than arsenobenzol, but a reaction that has remained positive during the course of bismuth treatment tends to become negative within a few weeks after interruption of the injections. Bismuth was observed to have no effect whatever on chancroid.

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Recognition of Congenital Syphilitic Inflammation of the Long Bones.—Hubert M. Turnbull (*Lancet*, June 24, 1922) asserts that syphilis in the fetus may produce inflammatory changes in the diaphysis, at a distance from the epiphysis, or in the periosteum, but more frequently in the metaphysis and in the epiphyseal cartilage itself. The most important guide to the presence of pathological processes is the line of provisional calcification stretching unbroken from one side of the bone to the other and varying in depth at different ages, in different bones and in different portions of some epiphyses, being the deepest where the growth is most active. The effect of syphilitic osteochondritis upon the normal zones of bone varies according to the degree of injury by the spirochetes and their toxins, the stage and intensity of the inflammatory reaction and the site (cartilage or metaphysis) of the greatest injury and inflammatory reaction, resulting accordingly in manifold effects. Microscopically, there are seen deepening of the zone of provisional calcification, irregularity of the line of junction between the epiphysis and diaphysis, multiple zones of provisional calcification, enlargement of the chondral vascular canals and fibrosis in the marrow of the metaphysis or of the canals of the epiphyseal cartilage. This condition should be differentiated from rickets, which shows absence of calcification, whereas in syphilis there is no softening of bone, except in areas of fibrosis accompanied by erosion of bone.

Syphilitic diaphysitis is quite frequently seen. Here the fibrosis is associated first with the cessation of the deposition of bone and later with erosion of the bone trabeculæ and calcified cartilage present. Syphilitic periostitis is rare, but may accompany advanced osteochondritis. It results in a layer of bone and red marrow, or rarely granulation tissue which is deposited outside the original corticalis. This condition is easily recognized by the naked eye.

Congenital bone syphilis is not a general systemic condition but is due to the local presence of spirochetes. The older the child, the fewer the portions of bone affected. As many bones as possible should be examined, the femur, tibia, humerus and ribs being the sites of predilection. When making sections, the bone should be decalcified as little as possible. Fetal bones, fixed in four per cent. formaldehyde solution and embedded in paraffin or celloidin are easily sectioned. If the spirochetes have not been destroyed, a certain diagnosis can be made with the dark ground illumination with scrapings from the metaphysis which have not been immersed in a fixative.

Icebox Modification of Wassermann Test in Diagnosis and Treatment of Syphilis.—Albert Keidel and Joseph Earle Moore (*Bulletin of the Johns Hopkins Hospital,* September, 1921) deal in this paper with the icebox test from the viewpoint of its practical application in the diagnosis of syphilis, and more especially as a guide in its treatment. Three hundred cases have been examined by the icebox method in parallel series with the original Wassermann technic. The cases are divided into three groups, the first consisting of thirty normal persons, and seventy-seven patients with clinical nonsyphilitic diseases. From the results of the tests in this group it is concluded that probably no false positive results were obtained, and that the icebox method of fixation with either plain or cholesterinized antigens is not too delicate. In the second group there are seventeen cases, in sixteen of which the diagnosis of syphilis was doubtful on clinical and other serological evidence, and one apparently normal person with an unconfirmed history of syphilis twenty-one years ago. In this group in all the cases in which a positive or doubtful icebox test was obtained, the clinical evidence pointed to a diagnosis of syphilis so that the authors believe no false positives occurred here. In the third group are 176 syphilitic individuals, 148 treated and twenty-eight untreated patients. In eighty cases the two methods showed complete agreement in the results. The icebox method exhibited greater sensitiveness in fifty per cent. of the entire group, showing the most striking difference in the greater persistency of positive reactions or some degree of fixation by this method in treated cases. The results indicate that our present standards of treatment of syphilis are probably too low, and that treatment should be continued over a much longer period of time than is now the case.

A New Intracutaneous Reaction in Syphilis.—Attilio Busacca (*Wiener klinische Wochenschrift,* June 8, 1922) finds that the intracutaneous injection of a ten per cent. sterile solution of gelatin, of which only the vials of solid gelatin can be used, produces a positive local reaction in tuberculosis of the skin and in syphilis and rarely in other dermatoses. Among thirty cases of tuberculosis, only thirteen were positive, but the reaction was positive in seventy-one per cent. of cases of syphilis (with a simultaneous positive Wassermann reaction, in eighty-two per cent. of cases); more frequently with primary lesions without exanthem than in tertiary metasyphilis and hereditary syphilis; also more frequently in latent than in secondary syphilis. This reaction may be due to a fixation of the toxic substances of tuberculosis and syphilis by the gelatin. The author believes that this reaction may be used, with certain restrictions, for diagnostic purposes.

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The Treatment of Skin Cancer by X Rays, Radium and Electrocoagulation

By GEORGE E. PFAHLER, M. D.,
Philadelphia.

Practically all cancers of the skin can be treated successfully by means of x rays, radium and electrocoagulation, providing they are treated early and treated skillfully. Any one of these three agents will cure the majority as they come, but in many instances, two or three of these methods may be combined to advantage, and in advanced cases it is often necessary to combine with these agents the services of the surgeon. When the disease has invaded the deeper tissues, and especially when it has extended to cartilage, bone or to the lymphatic glands, the outlook is much more grave, the amount of treatment required is greatly increased, and even after long struggles failure will be common. Therefore, it should be the aim of all physicians to treat these lesions thoroughly and skillfully as early as possible—preferably before they have become definitely cancerous.

TREATMENT OF PRECANCEROUS LESIONS.

The keratoses which develop especially in older people as the result of exposure to the sun's rays, wind, or cold, or excessive heat, or any form of constant irritation, can all be cured by electrocoagulation, and I believe this is the best method if the lesions are isolated and not too numerous, because in this process of destruction there seems to be a healthy regeneration of the skin, and if they are quite superficial no scar results. It is best done by means of the Oudin current with a very fine brush spark flowing from a very fine needle, and used just long enough to turn the crust white. As a result, there follows then the exudation of serum, crust formation, desquamation and complete healing. The crusts can be avoided by the application of petrolatum or cold cream on muslin, and changed at least twice a day. This form of treatment is especially to be recommended in the keratoses occurring on the hands of röntgenologists or those who have been exposed very much to the x rays. Skill of course counts in this just as in any other procedure. In the hands of other men it is entirely possible that some other form of treatment will be equally satisfactory. If the keratoses are extensive, such as sometimes occur on old people in whom most of the skin of the face is involved, the x rays may be used to advantage. In fact, these keratoses can be removed in any case by the x rays, but I prefer electrocoagulation because the x ray itself produces atrophy and devitalization of the tissues very much as the original irritant has done. If the x rays are used for this purpose, they should be used either without filtration or with not more than two millimetres of aluminum filter, and a dose should be given sufficient to produce a definite erythema. In some of these cases, the great majority of the lesions will disappear, and then the few remaining can then be destroyed to advantage by means of electrocoagulation rather than expose the surrounding tissue to further devitalization by the x rays.

WARTS AND MOLES.

Warts and moles I believe are also best destroyed by electrocoagulation and by a very similar procedure as described above, except that more current is used. It is of advantage, however, to use as light a current as possible to produce the result, because if a very heavy, hot, fat spark is used I believe there is more likelihood of the development of thickened scars. Therefore, it is much more desirable to proceed slowly and take a longer time to destroy the individual lesion. Warts will also respond generally to x ray treatment and to radium applications.

BASAL CELL EPITHELIOMATA.

Basal cell epitheliomata are the most responsive to any form of treatment and they are the group that has made the plaster quack famous. Plasters can be used successfully in this group of cases if used thoroughly and skillfully, but all of these lesions can be beautifully destroyed by electrocoagulation which is immediate in its effects and can be controlled so as to accomplish exactly what the operator wishes. The lesion can be curretted away,

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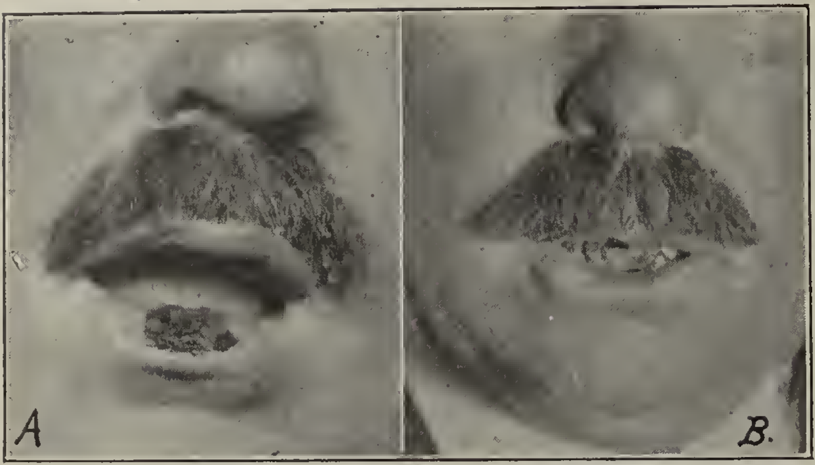

Fig. 1.—Epithelioma of the lower lip.

A, Duration three years, July 15, 1915. Destroyed by electrocoagulation, followed by deep röntgenotherapy over the chin and submaxillary region.

B, September 25, 1916, showing lesion completely healed. Patient is still well April, 1921.

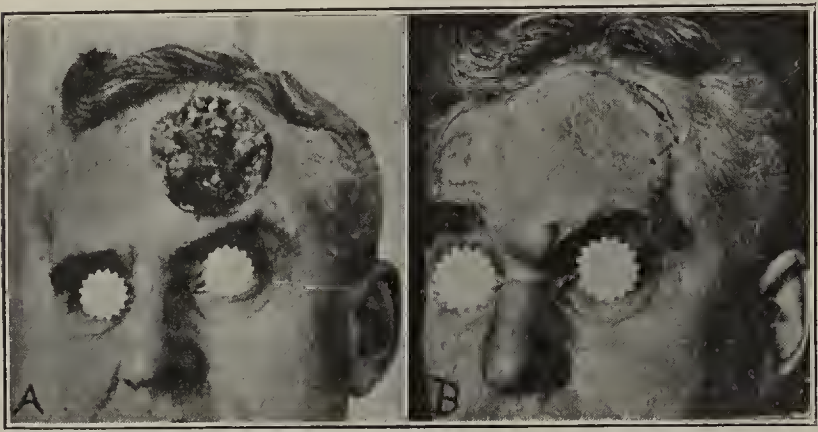

Fig. 2.—Epithelioma in left forehead.

A, Eight years' duration. Had been treated previously by caustics, carbon dioxide snow, ultraviolet rays, curettment and x rays. The bone was involved when referred for treatment October 31, 1913. Treated by electrocoagulation and x rays. As explained at the beginning this caused death of the outer table of the skull in this region, and the sequestrum was removed by Dr. M. P. Warmuth followed by a skin graft from the opposite side of the patient's forehead.

B, showing final result November 18, 1914. Still well 1921.

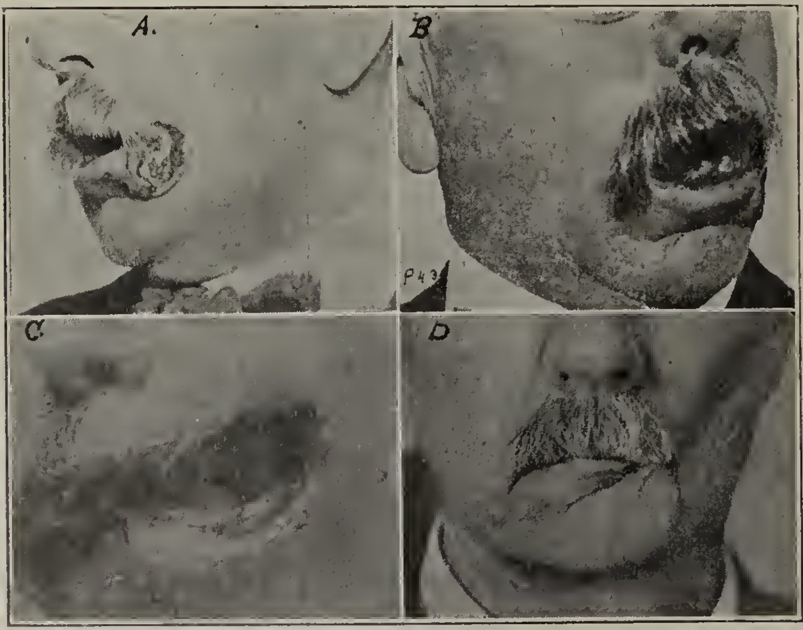

Fig. 5.—Recurrent epithelioma involving the left side of the cheek, half of the lower lip, one third of the upper lip and extending backward inside of the mouth to the angle of the jaw.

A, January 20, 1913, complete destruction by electrocoagulation followed by deep röntgenotherapy.

B, Shows part of the growth projecting inside the mouth.

C, Shows the wound after the slough has separated nine days after the operation.

D, Shows wound closed by Dr. Laplace, April 20, 1914. Patient was still well in April, 1921.

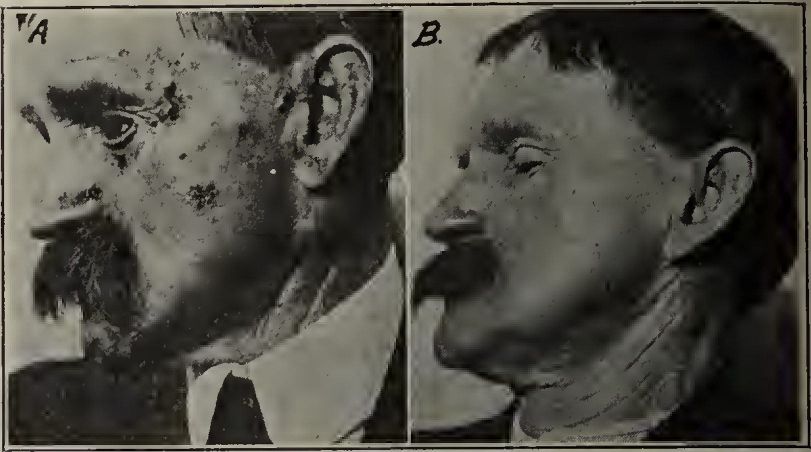

Fig. 3.—Multiple epitheliomata on the face with keratoses and with metastasis below the ear.

A, October 13, 1920. Lesions on the face treated by electrocoagulation and x ray, and the metastatic lymph node treated by the insertion of radium needles, eighty milligrams being inserted on October 12, 1920, for a period of five hours, and again on November 23, 1920, for a period of six and a half hours.

B, January 18, 1921. All lesions on the face had healed. Metastatic nodule disappeared.

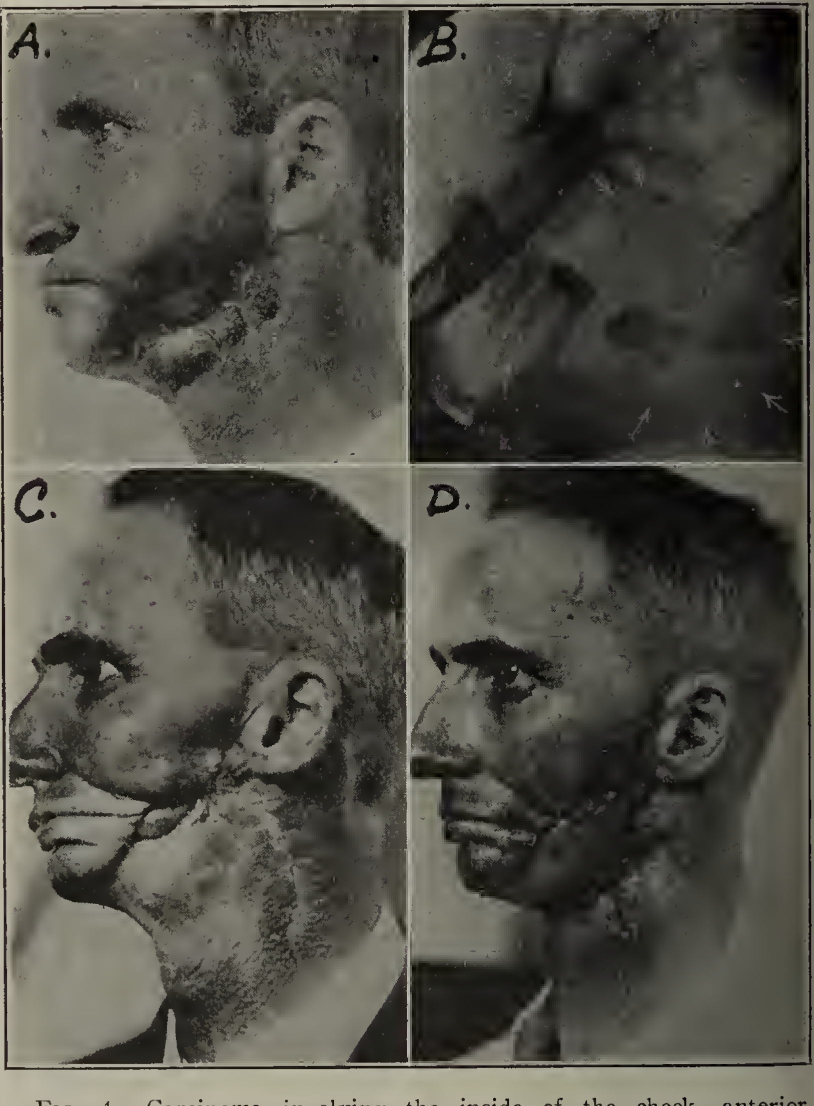

Fig. 4.—Carcinoma involving the inside of the cheek, anterior pillar of the fauces, the superior maxilla and the entire inferior maxilla, with a mass of metastatic lymph nodes below the angle of the jaw.

A, On June 10, 1915, resection of the left half of the lower jaw was done by Dr. Ernest S. Laplace with removal of the metastatic glands so far as possible, followed by radium applied inside the mouth against the superior maxilla and x ray treatment given externally.

B, Shows the wound one month later.

C, Shows the wound after the first attempt by Dr. Laplace at a plastic operation to close the mouth.

D, Shows the final attempt at closing the mouth. The patient remained well to April, 1921, and was then working daily as a traveling salesman.

and if there is any bleeding granulation left, this can be further destroyed by the spark so that a definite and perfect result can be obtained. For this purpose I also use the Oudin current and a very fine brush spark, but the size of the spark and the length of application will depend entirely upon the size and location of the lesion. In all these cases I believe that it is advisable, and it is my practice, to apply a full erythema dose of the röntgen rays after the destruction. This gives double assurance of complete recovery. Generally a single combined application of this kind will be sufficient to cure the lesion. If there is any thickening of the scar, which sometimes occurs in the centre of a large lesion, it can be softened by further application of the x rays. In other words, it should be treated as a beginning keloid.

This treatment is the quickest and I believe the most certain method, but all of these lesions can also be cured by the x rays or radium if skillfully applied and, as has been shown by MacKee, the majority can be cured by a single application of the x rays. The x rays or radium are preferable in the treatment of all these lesions in which a scar is a serious objection. This applies especially to the lesions about the eyelids, and it is my practice to treat the lesions about the eyelids either with radium or the x rays. Either agent can be used with success. Bowen (1) of Columbus has shown brilliant results by the use of x rays in lesions about the eyelids, even in very advanced cases. For this purpose he uses from two to four erythema doses in a single application, but confines the radiation almost entirely to the actual size of the lesion. If the treatment is not given in this massive quantity at a single application, the radiation should be kept to the saturation point. That is, a full erythema dose should be given and repeated often enough and with quantities sufficient to keep the radiation at the point of saturation. In our experience we have had the best results in these epitheliomata about the eyelids with the use of radium, and in general if time and expense is no objection, I believe that radium will produce the best results in all of this class of skin lesions.

SQUAMOUS CELL EPITHELIOMATA.

Squamous cell epitheliomata, as we all know, are much more serious and much more difficult to cure. Therefore, I believe that it should be our aim to be as thorough as possible from the very beginning. Some of this group can be cured by the x rays. I believe a greater number can be cured by thorough application of radium, and I believe that the radium or the x rays should be used to the extent of actual destruction. That is, we should use three or four erythema doses at once or keep the radiation to the point of saturation continually until the lesion has disappeared. In this group a greater amount of filtration is desirable and at least six millimetres of filter should be used if the x rays are depended upon. I generally use a half millimetre of silver and a millimetre of brass with a millimetre of rubber for filtration if radium is used. I believe that the best results are obtained (at least in my experience) if the local lesion can be thoroughly destroyed by electrocoagulation, and then the x rays used to the extent of about one and a half erythema dose with six millimetres of filter. The same radiation should be used for the adjacent glandular area, and a full erythema dose should then be used again in three or four weeks. By following this technic I have succeeded in getting all of the primary epitheliomata of the lower lip well up to date, providing there has not been previously some form of incomplete treatment, either excision or some form of caustic application. I believe that this record is better than any that has been produced even by the most thorough dissections. Unless the work is thoroughly and skillfully done it should not be attempted, for tampering with a squamous cell epithelioma, especially of the lip, by partial destruction with electrocoagulation or incomplete radiation is just about as harmful as incomplete surgery or incomplete treatment by caustics.

EPITHELIOMATA WITH METASTASIS.

This group is always very serious and the prognosis is generally bad. It had been my practice until the past year to advise treatment of the local lesion by either excision, electrocoagulation plus preliminary radiation, or treatment of the local condition by radiation and electrocoagulation and then careful dissection of the metastatic glands following a thorough preoperative radiation. This has given some brilliant results, but recently I have had successes in the elimination of the metastatic lymph nodes by the introduction of radium needles, and I think this is a form of treatment which should be seriously considered at present together with thorough radiation by the x rays filtered through from six to ten millimetres of aluminum and at a distance of thirty to forty cm. with a 9″ parallel spark gap and five milliamperes of current, the time depending upon the amount of filtration. When I use radium needles in metastatic glands I prefer to use them about two weeks after a full dose of x ray treatment has been given over the general glandular area. It is not safe to use these two forms of radiation at the same time for fear of an excessive reaction.

CONCLUSIONS.

1. Precancerous lesions such as warts, moles, keratoses and slowly healing fissures should be destroyed by electrocoagulation, and in this way a great many cancers can be prevented.

2. Every case of epithelioma should be thoroughly treated and completely eliminated at once. It is unwise to destroy cancer piecemeal.

3. Radium properly applied is the best single agent in the treatment of cancer.

4. In all well advanced cancers two or more methods can generally be combined to advantage in the complete elimination of the disease.

5. Skill, keen judgment, and careful consideration of the individual patient count for much in this field as they do in every other branch of medical science.

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1321 Spruce Street.

Reeducation in Writers' Cramp

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Occupation cramps, designated as occupation spasms by Duchenne, of Boulogne, functional impotencies by Gallard, occupation dyskinesias by Jaccoud, and occupation coordination neuroses by Benedikt, are characterized by spastic contraction occurring at the start or in the course of the execution of regular and sustained work. The term cramp applied by Cazenave to this disturbance is inappropriate, for occupational spasm may occur without being accompanied by the least degree of painful and involuntary contraction of any of the involved muscles. As Macé-de-Lapinay says in his excellent paper on occupation cramps, "Cazenave was endeavoring to translate the German word *krampf;* but the meaning of this word is convulsion rather than spasm." Custom has led to continued use of this inappropriate designation, and authors have been employing it in describing the most diverse forms of occupational spasms.

Of all occupational cramps, writers' cramps is the commonest and the most extensively studied. It occurs in three forms, described by Duchenne, of Boulogne: 1, The spastic form, characterized by muscular contraction, either painful or painless; 2, the tremulous form, characterized by clonic or tremulous contraction, and 3, the paralytic form, presenting paresis or even paralysis of one or several muscles. Writers on the subject are not in complete accord regarding the pathogenesis of the disorder.

According to some, writers' cramp is of peripheral origin, consisting of a tenonitis, local neuritis, arthritis, periostitis, myositis, circumscribed cellulitis, etc. These rather trifling conditions may, in course of time, be the source of disturbances, at first imperceptible but later more conspicuous, in the execution of the complex act of writing. They finally constitute that which Macé-de-Lapinay (of Néris) terms the "irritative thorn" (*épine irritative*) in the mental state of the patient. They cause, in addition to the disorder referred to, a psychoneurosis which at times attains to such a degree that the disturbance exhibits all the earmarks of an affection of central origin. Duchenne, of Boulogne, was an authoritative protagonist of this conception. This great French neurologist recognized only the influence of the nerve centre on writers' cramp. Thus, he wrote: "It is by no means objectionable to me to suppose that the disturbance (during the act of writing) is located in the central nervous system."

There is no doubt that the individual psychic factor of the patient plays an important rôle in writers' cramp. This psychic factor, moreover, is readily explainable by virtue of the obstinate nature of the disease and the futility of palliative measures of treatment, which merely contribute to a perpetuation of the unfortunate patients' distress, constantly at grips as they are with the possibility of some day finding themselves deprived of their main source of revenue. The condition often amounts to a desperate struggle against a slowly and gradually progressive disease. Occupation cramp resembles, on the one hand, the incoordination of ataxic cases, since in both instances the motor disturbances, at first slight, ultimately pass into complete loss of function unless care be taken. On the other hand, cramp becomes manifest in the writer during the act of writing just as motor incoordination becomes manifest in ataxics during the act of walking. As in ataxics, too, it occurs in several forms, and may, according to the degree of ataxia, range from a simple spastic cramp to the paralyticotremulous type of cramps. Sometimes it becomes manifest only during certain kinds of writing. Thus, I have met with instances of writers' cramp which became manifest only during the writing of figures or of capital letters, while the other symbols were traced without difficulty. Similarly many ataxic patients, though able to walk readily on carpet or wood flooring, find it impossible to take a single step on macadam or other street pavement. It was on account of this similarity of locomotor ataxia to occupation spasm that Benedikt applied to the latter the term occupation coordination neurosis and I personally called it, more simply, occupation ataxic neurosis.

Few remedies have remained untried in the treatment of this ataxic neurosis of writers—a condition alike strange as to pathogenesis and simple in its manifestations. Iron, arsenic, nervines, iodides, belladonna, strychnine, atropine, rubbing with various liniments, hypodermic injections, and even hypnotism have all been used. None has yielded any encouraging results. Nor has rest been attended with any greater success; for often the patient suffering from writers' cramp has found his spasmodic disorder returning as soon as he begins to write. One of the measures recommended has been to discontinue writing with the right hand and learn to write with the left. Several cases, including some of Duchenne, of Boulogne, have shown, however, that when this is done the left hand is likewise seized with writers' cramp. Bier's hyperemia, pressure exerted by different kinds of bracelets, and various forms of penholders have not proven more serviceable than other measures. Puncture-cauterization, as recommended by Vigouroux, and electric treatment in all its modalities, have failed to yield much in the way of satisfactory results. A few writers, e. g., Eulenburg and Berger, even consider electric treatment harmful in writers' cramp. Laquerrière resorts to systematic, direct faradization of the affected muscles, with better luck. Yet systematic local electric treatment succeeds only in cases in which local pathological changes exist.

While surgical intervention proved successful in one case of Stromayer's, it failed completely in the hands of Dieffenbach, Langenbeck, and Ruppert. The last named surgeons did fifty tenotomies for occupational cramps and obtained nought but failures.

Systematic massage and reeducation, supplemented by hydrotherapy, alone constitute the foundation of rational treatment in writers' cramp. Massotherapeutic maneuvres succeed, through their tonifying action on the muscles in a state of hypotonicity, in reestablishing proper balance between the two antagonistic muscle groups which directly take part in the act of writing. These two groups of muscles are the flexors and adductors of the fingers and their antagonists, the extensors and abductors. The other muscles of the hand and arm are likewise concerned in the execution of the symbols of writing; but rather indirectly. Accordingly, the more highly perfected the act of writing, the greater the number of muscles that take part in it.

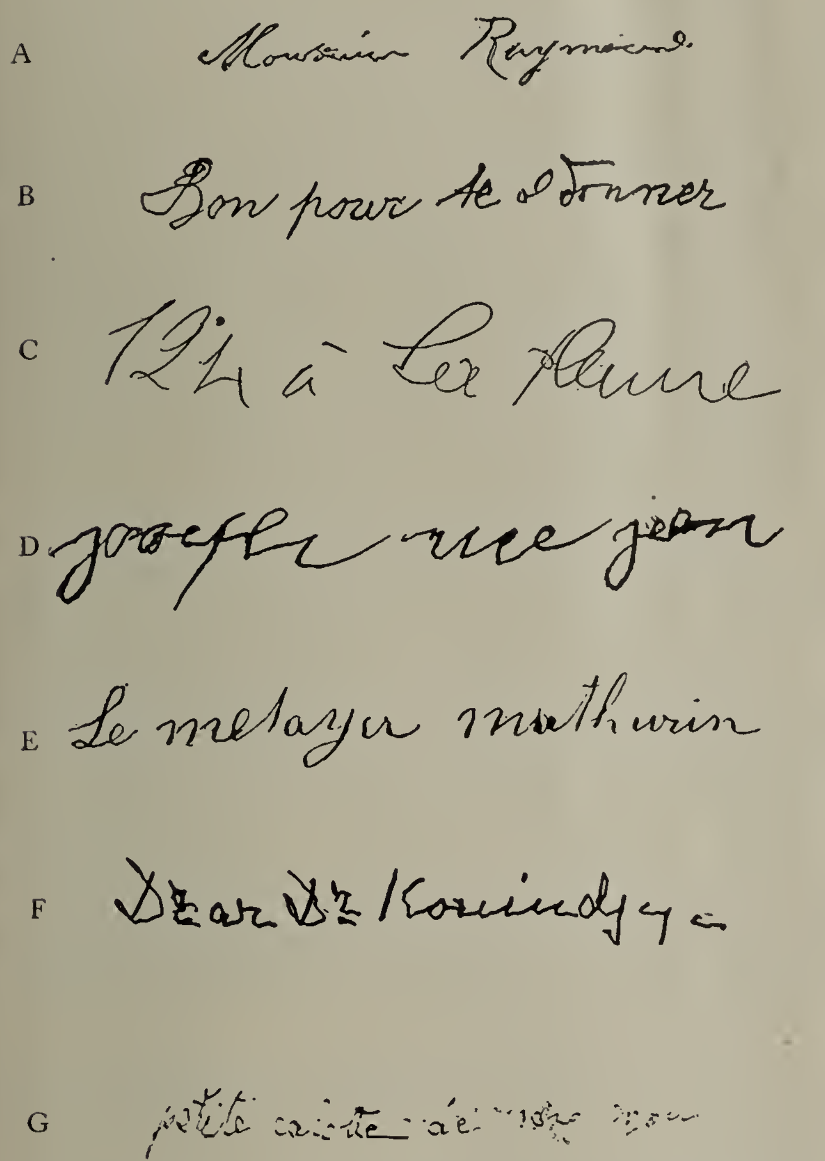

A Monsieur Raymond
B Bon pour [illegible] donner
C 124 à La [illegible]
D joseph rue jean
E Le metayer mathurin
F Dear Dr Kouindjy
G petite caisse de [illegible]

Fig. 1.—The different forms of incoordinate writing. A, tremulous type; B, paralytic type; C, spastic type; D, the writing of a laborer; E, the writing of a newspaper man; F, the writing of a hemiplegic subject; G, the writng of a tabetic subject.

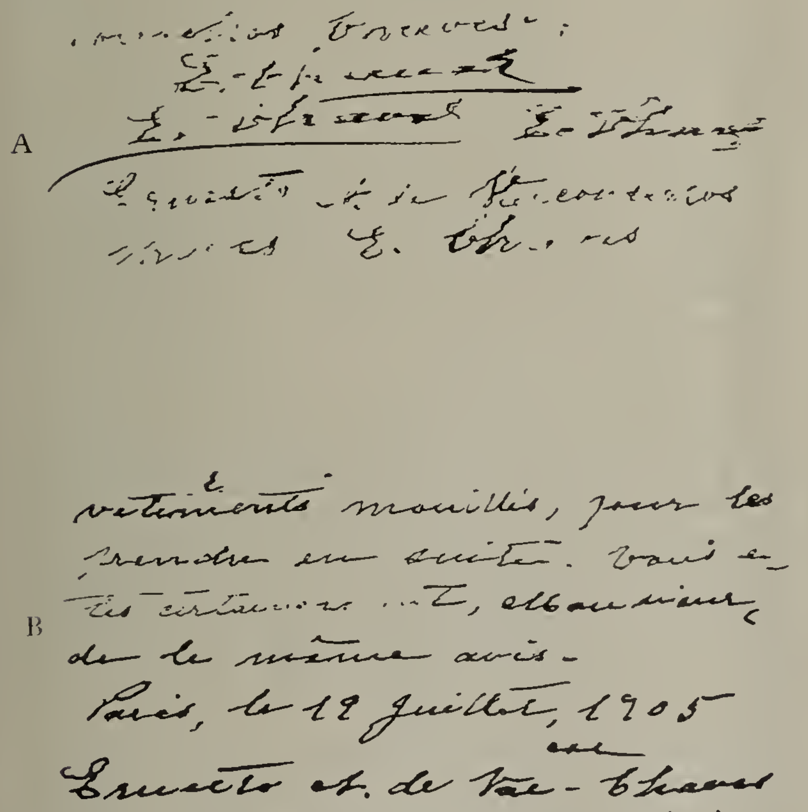
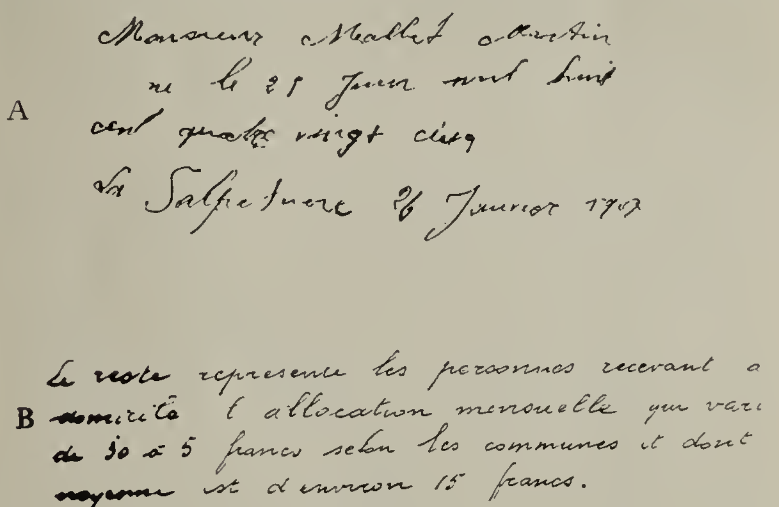

B
vêtements mouillés, pour les
prendre en suite. Vous ê-
tes certain[illegible], elle aussi
de le même avis.
Paris, le 12 juillet, 1905
Ernesto et. de Vae-Chaves

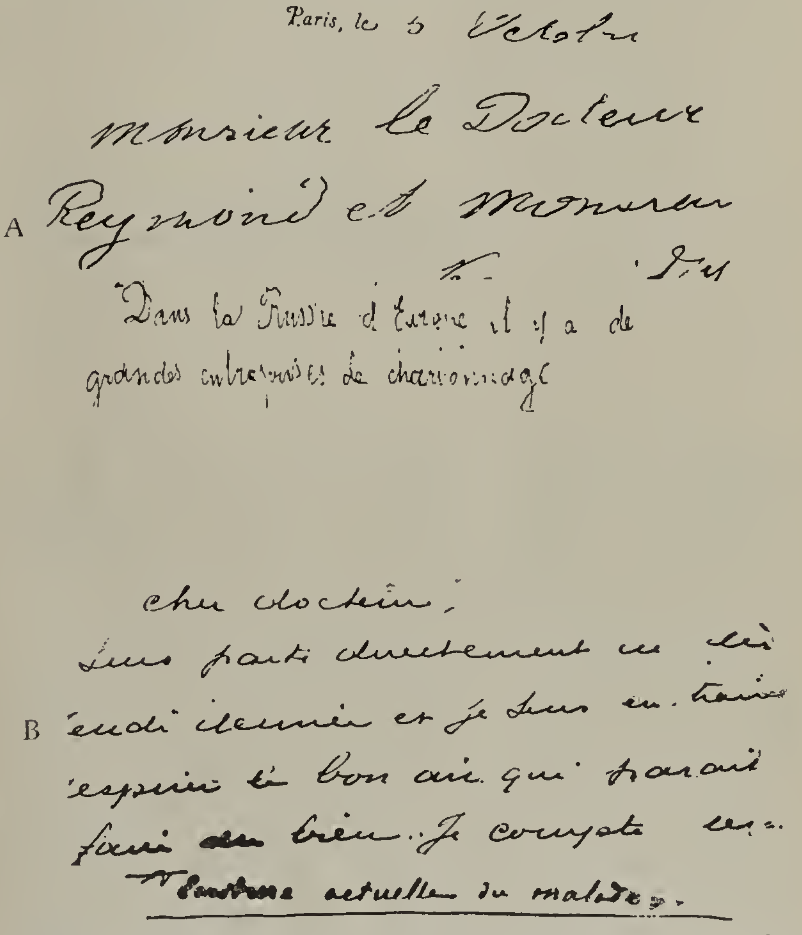
Fig. 2.—Severe example of the tremulous form of writers' cramp. A, before treatment; B, after treatment (two months).


A
Monsieur Mallet [illegible]
né le 21 Juin mil huit
cent quatre vingt cinq
La Salpetriere 26 Janvier 1907

B
Le reste represente les personnes recevant a
domicile l allocation mensuelle qui vari
de 30 à 5 francs selon les communes et dont
moyenne est d environ 15 francs.

Fig. 3.—Spastic form of writers' cramp. A, before treatment; B, after two months' of reeducation.

In the majority of instances of writers' cramp the spasm is located in one or more flexor muscles or in the adductors. These muscles are then in a condition of hypertonicity, while their antagonists, the extensors and abductors, are in a condition of hypotonicity. The hypotonic muscles must be subjected to massage and the hypertonic muscles left alone. The treatment is always begun by superficial and deep effleurage, followed by circular and deep pressure to which are promptly added percussion, with


A
Paris, le 5 Octobre
Monsieur le Docteur
Reymond et Monsieur
Dans la Russie d Europe il y a de
grandes entreprises de charbonnage

B
cher docteur,
suis parti directement ce [illegible]
[illegible] dernier et je suis en [illegible]
espérer le bon air qui pourrait
faire du bien. Je compte [illegible]
[illegible] actuelle du malade.

Fig. 4.—Spasticotremulous form of writers' cramp. A, before treatment; B, the patient's handwriting at the present time. Recovery has been maintained for eighteen years.

the finger or hammer, tappings and vibration treatment.

The massage is supplemented by active exercises calculated to activate contraction of the muscles previously subjected to massage. Forceful exercises which further strengthen the hypertonic muscles and thus maintain or increase the spastic contraction of the flexors are avoided. Preference is given to the following exercises, carried out without effort or fatigue:

In the first exercise the patient's arm is placed either on a stool or on a table, in such a way that his fingers are completely free. To one of the phalanges of any one of the fingers is tied a piece of string or ribbon, to the other end of which is fastened a small receptacle such as a small pail, a purse, a small bag, or a basket. In this receptacle are placed various weights, beginning with one of fifty centigrams, which is later increased by twenty-five or fifty centigrams. The patient is required at command to raise the finger as high as possible and then lower it, likewise at command. This exercise is repeated five, ten, fifteen or more times. The string is thus tied to the adjacent phalanx, to another finger, or even to two fingers at the same time.

The next exercise consists of stretching the arm and hand out as far as possible and placing on the dorsal surface of the fingers a small rubber ball or a coin, a disc of leather, a small stick, or other implement. The patient's arm being in complete extension, he is requested to toss up the article laid on it and receive it again on the dorsal surface of the hand. This exercise is repeated from two to four times and concluded by tossing the article up again and receiving it on the palmar surface.

In the third exercise a long stick or cane is placed on the dorsal surface of the fingers of the affected hand, with the arm completely extended. Thereupon the cane is made to turn several times around the ulnar border of the hand. The cane should always come back on the back of the hand. After four or five turns the cane is seized in the palmar surface.

The purpose of these preliminary exercises is to prepare the muscles of the affected hand for the reeducative exercises of actual writing. The latter constitutes the fulcrum of the author's reeducative treatment of writer's cramp. In order to secure a satisfactory reeducation of the act of writing it is necessary above all to place the spastic muscles more or less completely at rest during the writing and to teach the patient to write slowly and deliberately. The first of these required conditions I have succeeded in obtaining by teaching my patients to write with the hand inverted. The second is secured by teaching them to write discontinuously, i. e., with intervals of rest. By inverting the hand during the act of writing, one succeeds in localizing the movements of writing in the extensor muscles, which under these circumstances make the heavy strokes from below upward, whereas normally the heavy strokes are made by the flexors, and from above downward. In consequence, the reeducated writing by the inverted hand is executed by the extensors, in contrast to ordinary writing, which is executed by the flexors. To obtain the intervals of rest in the course of the writing it is sufficient to have the patient dip his pen into the ink between the execution of two consecutive letters or strokes.

Reeducation of writing is begun by having the patient make straight strokes, in the following manner: The patient, seated in front of a low writing pad, with his right forearm parallel to the edge of the table, places his hand down on its dorsal surface and holds the pen between the thumb and the palmar surfaces of the first two or three fingers. The right elbow should be on the table and maintain the same position as long as possible; the left hand meanwhile moves the paper as required. The inkstand is within reach of the right hand, so that the patient has merely to extend the hand to have the pen dip into the inkstand, two thirds filled with ink. At command he makes a straight stroke with the pen; then, again at command, he dips the pen into the ink. Thus the stroke is made in one step.

When the patient is deemed capable of tracing the various letters of the alphabet easily with the inverted hand, the rest periods during which he dips the pen into the ink are shortened and he is allowed —at command, as usual—to trace entire letters, syllables, words, and even short sentences. In this way there is acquired an ability to write with the hand inverted, which procedure enables one to avoid the spastic contractions of the flexors thus partly excluded from the act of writing. The repeated rests are for the purpose of obviating fatigue of the extensor muscles, unaccustomed as they are to tracing consecutive letters in the act of writing, and of producing frequent movements of extension and flexion of the fingers and wrist.

These exercises of reeducation in writing are also carried out by the patients at home in the form of set tasks not exceeding in duration twenty to thirty minutes a day.

When the patient has mastered the process of writing with the hand inverted, he is allowed to write in the ordinary way from time to time on condition that he does so deliberately and slowly. In this wise the patient acquires the ability to employ regularly two forms of writing, viz., with the hand inverted and in the ordinary way. The advantage of this plan is manifest even after conclusion of the treatment, and whenever he experiences the characteristic spasm during the act of normal writing, the reeducated patient turns his hand over and continues writing with the hand inverted. As soon as the spasm of the flexors passes off he resumes the ordinary mode of writing.

How does the writing with the hand inverted act? We have seen above that this process of reeducation permits of largely obviating the characteristic spasm. In addition, it permits of regulating the motion of writing, of grading the alternate contractions of the antagonistic muscles, and of slowing the actual execution of the various letters embodied in the writing. Slow, deliberate, and regular writing is frequently sufficient, as Gilbert-Ballet stated, to improve an occupation cramp.

Reeducation of writing, however, also acts by suggestion in this instance. The variation in the letters traced by the inverted hand, the rest intervals or the rests to dip the pen into the ink, and the strict discipline involved in the method in order to write well exert a definite influence upon the patient's mind and demonstrate to him, as Brissaud puts it, "in what respect his will power is at fault." It creates in the patient a proper coordination of all the movements of writing and requires of him active collaboration throughout the treatment. Indeed, both the physician and the patient must contribute, each one his own part, to obtain the desired result, viz., cure of the condition. The physician should not overlook the fact that the great majority of persons afflicted with writers' cramp are neurotics, in whom the disturbance becomes a nightmare. The reeducator should endeavor to modify this psychic state of the patient, alike by variation of the exercises prescribed and by more or less prolonged contact with the patient. The duration of the treatment is, on an average, from two to four months. After the treatment, however, I continue observation of the writing of these patients, having them come to my office once or twice a month for several successive months.

In the course of the treatment the reeducation exercises are carried out daily for a period of one quarter to one half hour. The patient also goes through the exercises at home every day and, if possible, should discontinue clerical work particularly for the first two months of treatment. If it is not feasible for him to give up the work, he should be recommended to avoid fatigue and to carry out exercises apart from his work and after a relatively long rest.

To summarize, the method described has yielded a respectable number of recoveries, even of prolonged duration. The results are dependent upon the social circumstances of the patient. If it is possible for him to restrict his writing, he may secure recovery for a very long period. Thus, one of my patients, engaged in extensive industrial pursuits, who had been suffering from the spasticotremulous form of writers' cramp for seven years, recovered under my method of treatment and has remained cured for at least eighteen years. I have had occasion to see him from time to time and have invariably observed that his writing was improving steadily; he now writes without any difficulty and has never since experienced any spasm. Unfortunately, in many cases it becomes necessary from time to time to resume the reeducation process, as writers' cramp is subject to recrudescences and even relapses. Treatment for one or two months is sufficient, however, to bring complete relief again.

Yet, no undue illusions as to the efficacy of treatment should be entertained. There are some instances of writers' cramp, particularly among subjects whose livelihood depends upon constant writing, which too often relapse and which are at times refractory to the treatment. Happily, these cases are very few. They do occur, however, and the reeducator should bear this fact in mind.

A treatment at such resorts as Néris-les-Bains, Aix-les-Bains, or Royat, with local and general douches, may be serviceable in supplementing the treatment, which is based, as already explained, upon systematic massage and reeducation of the act of writing by means of inversion of the hand.

32 Rue de Liége.

Factors of Longevity in the Semitropics*

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It is the preeminent function of the medical profession to prolong human life and to make it as efficient as possible, and it is our belief that the area of the earth's surface known as the semitropics presents the greatest possibilities for human development and maintenance of human efficiency.

It is suitable to allude briefly to some of the factors brought into operation in the past quarter of a century, which have increased man's expectancy of life in all zones. Diphtheria has been shorn of its terrors by the use of antitoxin, typhoid fever is now well understood and is as preventable as delirium tremens. In 1898 we had an army of 107,000 men. Typhoid fever was the cause of eighty-six per cent. of the deaths in that army. Typhoid fever was a worse enemy than Spain. If we had had the same deathrate from typhoid fever in 1917 that we did in 1898 we would have had 144,568 cases, ten per cent. of the patients would have died, or in round numbers fourteen thousand and five hundred men. On the Mexican border in 1916 we had twenty thousand men and two died of typhoid fever. In 1918 in Chickamauga Park we had three hundred thousand; two had typhoid fever, and both recovered.

When we took over the Panama Zone in 1897 the deathrate there was 138 to the thousand a year. At the same time the deathrate in Portland, Maine, which was at that time the city of lowest deathrate in the United States, was 15.7 to the thousand a year. As a result of the sanitary work of the Medical Department of the U. S. Army the deathrate in the Panama Zone today is 12.6 to the thousand a year, which is less than the deathrate of St. Petersburg, Florida, the most healthful city in the United States today.

Twenty-five years ago for any considerable number of people to move from the north temperate zone to the semitropics was relatively a greater hazard than for an army division to go "over the top" in France. The sanitary conquest of the tropics and semitropics as accomplished by the Medical Department of the Army is one of the greatest accomplishments of civilization. Proof that malaria could only be caused or transmitted by the anophele mosquito, and yellow fever only and always by the stegomyia mosquito, was the nucleus of knowledge which built the Panama Canal, and has caused this zone now to be the healthiest zone under the American flag. Other factors operative there are obedience to laws of health.

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*Read at the annual meeting of the Florida State Medical Society, held in Havana, Cuba, June, 1922.

We allude to these incidents merely to illustrate what we may now state without fear of being accused of boast or conceit; that the medical profession does prolong life and make it more efficient, as we stated in the beginning was our function.

Factors of longevity in the semitropics is a suitable subject for study by the medical men of semitropical Florida, that we may the better educate the laity, which is as a rule about a quarter of a century behind the specifically educated profession. Whether Florida or Isle of Pines is a better place in which to grow grapefruit does not concern us. Whether the state capital is located in Pensacola or Key West is not our business. A radio broadcasting station in the centre of the state might accomplish as much as a legislative assembly so far as we know.

LIMITS OF SEMITROPICAL ZONE.

What are the limits of the zone that we are to accept as semitropics? The tropic of Cancer is 23° 28′ north of the equator. The tropic of Capricorn is 23° 28′ south of the equator, and between these arbitrary lines is the zone that we know as the tropics. The semitropics are not as clearly defined. We speak of the torrid zone, the frigid zone, the north temperate zone and the south temperate zone and the semitropical zone. Florida lies between the twenty-fifth and thirty-first parallels of latitude. The Arctic Circle is at the sixty-seventh parallel of north latitude approximately. The semitropical belt we believe may be properly considered to be north from the tropic of Cancer to the southern limit of snow, and south from the tropic of Capricorn to the northern limit of snow, this of course at sea level.

Meteorological or climatic conditions vary from astronomical climate within any zone or parallels of latitude according to many influences, such as altitude, nearness to the sea, character of the soil, direction of prevailing winds and possibly other factors. What then is the constant factor of climate universally operative in every zone?

Obviously it is the sun's rays, the percentage of uninterrupted sunlight, and the angle at which these rays reach the surface of the earth. Or to put it in one word, actinism. Within the zone which we have designated as semitropical, we have Spain, Portugal, southern Italy and all bordering on the Mediterranean Sea, northern Arabia, Persia, northern India, the central zone of China, Japan, northern Mexico, all of Florida, and in the south semitropics we have the northern part of Chile and the Argentine Republic and South Africa and the southern half of Australia.

Thus it is seen that to speak of all the factors of longevity in all of the semitropical zones of the earth would in reality take in nearly all meteorological conditions encountered in the habitation of man. It will therefore be of more practical utility for us to consider conditions as we find them in our own semitropical Florida and other sealevel and peninsular countries.

We have had the suggestion implanted within us in our Sunday school catechism that anything beyond three score years and ten was to be accounted to strength, and the inference is that it would be unusual strength. We would in no way wish to be considered as criticising Holy Writ. But let us consider for a minute a sort of empirical biological law, or perhaps rule would be better. It is this: The age in years required by any warmblooded animal to attain complete physical development multiplied by five will give that animal's expectancy of life as near as any other mathematical rule. A horse is mature at five years and we expect him to live about twenty-five years. A cat matures at three years and will live to be about fifteen years. An elephant is mature not until he is thirty-five and will live under normal conditions two hundred years. Hibernating animals as a rule live longer than nonhibernating animals, and it is interesting to note that they all mature comparatively late in life, and incidentally it will be noted that most hibernating animals have relatively a high degree of intelligence. The black bear and beaver are good examples of this. Man matures at eighteen and should live to ninety years. If a normal, well born child does not live ninety years it is due either to ignorance of physiological laws or to an accident, for without doubt the normal human machine was wound up to run at least that number of years.

Methuselah lived, if we are correctly informed, to be 969 years. We are inclined to question the accuracy of this statement and to believe that a family name was mixed up with an individual. This same applies to Shem, who is said to have lived to be six hundred years old. There is little doubt that Abraham lived to be 175 years, Isaac to be 180 years, Jacob to be 147 years and Joseph to be 119 years. Early vital statistics in Italy give the time of death of 147 people who lived above one hundred years. Namely, fifteen died at 110, twenty at 125, forty at 130, forty-two at 136 and thirty at 140. Among ancient philosophers we note the ages of Hippocrates to be 101, Isocrates ninety-eight, Zeno ninety-eight, Diogenes ninety, Sophocles ninety. In studying the lives of 1,280 men who have lived upwards of one hundred years from Methuselah to the present we observe that with but sixty-five exceptions all have lived in the semitropical zone, and incidentally it is interesting to note that they were with few exceptions lactovegetarians.

The original use of the word climate meant the incline of the sun's rays to the earth and consequently was of purely astronomical definition, but with the invention of the thermometer, barometer, hygrometer, actinometer, and other instruments of precise measurement of meteorological conditions and phenomena, the word climate has come to mean the sum total of all atmospheric and telluric conditions which obtain at any given place. Isothermal lines may take us thirty to forty degrees north or south of any parallel of latitude. The flora and fauna of any locality depend more upon the average annual temperature, which may be caused by ocean currents, proximity of mountains, wind or soil, than it does *per se* upon latitude.

ACTINISM.

In the study of actinism we are concerned in the study of a force the relative importance of which is hard to comprehend or define. If we were to say it is a force as important as gravity, or magnetism, or heat, we might provoke argument. It is a powerful force and one little considered. It is the force of the sun's rays which causes the seed to germinate; it is the force which penetrates the soil and liberates chemical elements and makes them available as plant fertilizers. Without actinism the sands of Florida would be a barren waste.

The actinic rays of the sun are those rays which produce the chemical changes on the photographer's plate or film. These rays differ from the heat rays of the sun and are not produced by any electrical device. Actinism does not result from luminosity, and may take place with much diminished luminosity. This is demonstrated by the use of certain ray filters. A ray or color filter of violet, indigo or blue will not intercept the actinic rays but a filter of red, orange or yellow, and to a faint degree green, will intercept actinic rays more or less completely, according to the density of the screen. The effects of actinism on wines has been understood, although it has not been named for several generations in France and Italy. Actinism destroys the bouquet of wines if they are put in white or blue tinted bottles. Red wines preserve their own bouquet because of their color better than white wines. Actinism promotes oxidation and changes the molecular arrangement of the atom.

Actinism is more powerfully operative in the semitropics than in parallels of latitude more remote from the equator. It might seem on superficial consideration that, inasmuch as the sun is 92,897,000 miles from the earth, forty or fifty miles more or less would not be a factor influencing natural actinism, but let us see; suppose the angle of incidence of the sun's rays is 45° in the vicinity of New York or Chicago. It is quite obvious that they strike the earth at a lesser angle at the tropics and semitropics. In other words, the sun's rays, actinic and other, pass through several hundred miles more of the earth's atmosphere as we get farther and farther from the equator. The earth's atmosphere is to a certain degree a ray filter and the more foreign matter contained in the air and the more of the air the rays have to pass through the more the actinic rays will be filtered out. In this connection it is well to note atmospheric conditions which obtain in insular and peninsular countries, such as Italy, Spain, Portugal, Central America, Lower California and Florida. There is less dust, smoke and other foreign matter in these regions. Florida is a unique peninsula in that it is flat and has no mountain ranges to cool and make sudden variations in temperature or humidity. Its almost insular location insures an atmosphere almost free from contamination. Actinism explains why we can grow pineapples and orchids on what would seem to many people absolutely unproductive soil. Actinism is inimical to lower forms of life, and where the line of demarkation between animal and vegetable is hard to determine. Vegetable moulds and bacteria are killed by sunlight. There are very few pathogenic bacteria that will grow in any medium when exposed to sunlight. This fact and the large percentage of sunlight days explains why there is a happy absence of epidemic diseases in Florida.

The effects of the actinic rays of the sun on human beings is interesting and important. The effect is physiological, pathological, or therapeutic, according to the manner and object of their application. Long exposure to uninterrupted sun's rays in the semitropics lessens the percentage of hemoglobin in the blood. This may be of advantage in certain conditions of plethora and high tension, but applied to excess or to the wrong person may do harm. It is a remedial measure that should be handled intelligently like any other potent therapeutic measure. It is an error for a person from the north temperate zone to expose large areas of the body to direct rays of the sun as is often done for the purpose of tanning or pigmenting the skin, that some deluded laymen consider so beneficial. Because a little is good it does not follow that a good deal is better. Plethora and high tension may be benefited most decidedly by heliotherapy in conjunction with suitable dietary. An extensive sunburn is always accompanied by leucocytosis and a certain degree of hemolysis. This accounts for the feeling of lassitude and apathy that follows exposure to the direct sun's rays. Patients often wonder why they are fatigued after sitting in the sun, when they have taken no exercise. It is increased metabolism without voluntary effort. Actinic rays penetrate tissues deeply regardless of luminosity. The Negro race is protected from these results by the pigmentation of the skin which acts as a ray filter. The deposition of pigment in the white man's skin is nature's effort to compensate for the increased actinism which he has suddenly been obliged to experience. The different races of men have developed and evolved out of three hundred thousand years. Climate and consequent diet has made these races what they are and the white Nordic cannot change his physiological economy to that of the negroid type in one season in the semitropics.

Rheumatic and gouty arthritis receive wonderful benefit from heliotherapeutic measures. There is a wonderful field in Florida for the establishment of solariums, heliotherapeutic institutions and sanatoriums having as essential departments sun cure wards and sunparlors. No section of the United States is so well located for this purpose. Many skin diseases are quickly cured by no measures except the direct rays of the sun. Many skin diseases of bacterial and parasitic origin, also of nutritional and uric acid origin are immediately and permanently cured by this means alone. Most forms of neuritis are speedily relieved and presently cured by direct sunlight. Many cases that are treated by x rays and violet rays are better treated by the sun's rays. A one hour sunbath out on the back porch may not get the specialist a fee but it will get the patient with arthritis more than he would get for a fee.

There is no escaping the fact that Florida is an asylum for fifty per cent. of the winter residents that come to the state every season. It would be of commercial value to every hotel in Florida to have a sun parlor, a sun porch and sun rooms and little individual wind protected and sun exposed nooks and corners where certain of their guests could sit and get the benefit of the out of door air and sunlight as can be done in no other state in the Union in January, February and March. Hotel men do not like to have their hotels considered sanatoriums, but to a certain degree it cannot be helped. Nothing will be accomplished by hotel men making it inconvenient for a man or woman with sciatic neuritis, or circumflex neuritis, or arteriosclerosis, or arthritis, or many of the diseases and disturbances which people do not want to go to hospitals for to come to his hotel, and the sooner the hotels recognize this little bit of business the sooner that hotel will be considered progressive. If people did not get physical benefit from coming to the semitropics they would not come in increasing numbers each year. A man may come ostensibly to fish or to play golf but we have found that about ninety per cent. come to improve and perpetuate health and efficiency. The factor that improves it is sunshine. To digress and speak commercially: it is almost ludicrous to observe the policy of some otherwise nice cities in their fear that invalids will be seen on the streets and thus frighten away people who come just to have a good time and spend their money in riotous living. Some cities, on the other hand (one of which is the most rapidly growing city in the United States today), are awake to their advantage and so build their sidewalks that wheel chairs may with comfort to the occupant be wheeled across crossings from one street to another without jolt or violent effort. This little concrete incline is an invitation and a hand of welcome.

GEOGRAPHICAL DISTRIBUTION OF BACTERIAL DISEASE.

Certain diseases of bacterial origin have quite a definite geographical distribution dependent upon meteorological or climatic conditions. Probably twenty per cent. of all deaths north of the 30th parallel of latitude are due to diseases of bacterial origin, which gain entrance into the human economy through the bronchopulmonary mucous membrane, and are almost inescapable. The mortality from whooping cough, measles and scarlet fever, which are considered almost an essential part of a child's career in the north temperate zone, would be appalling if diseases of like mortality were encountered in the semitropics, with equal virulence and mortality. Mucous membranes are made susceptible of bacterial infections by the sudden and wide changes in temperature of the respired air, and as a result in the north we have catarrhal diseases that are never encountered in people whose homes are in the semitropics. A case in point is infantile paralysis. This disease, which is never epidemic in the semitropics, gains entrance to the human economy through the nasopharyngeal mucous membrane. Every epidemic of infantile paralysis in the north has followed a cold, wet season. Low temperatures lessen vital resistance and favor the development of pathogenic organisms which have a selective affinity for those structures.

According to reports of the United States Public Health Service forty-eight per cent. of deaths of persons over sixty years old north of the fortieth parallel in the United States are from pneumonia, and twenty-six per cent. of all deaths of all ages in this zone are from communicable bronchopulmonary and respiratory diseases, and south of this parallel this percentage diminishes as we go south, until in the semitropical belt pneumonia is accountable for a little over five per cent. of deaths of people over sixty, and bronchopulmonary diseases are correspondingly lessened.

Another factor which many lose sight of until it is too late; the normal temperature of a human being is about 98.2°, and every degree of temperature of the surrounding medium below this requires oxidation to maintain life. If the human body is surrounded by a medium the temperature of which is twenty, thirty, or forty degrees below normal body temperature, metabolism must proceed at a rate adequate to maintain the body at its normal, else death will result. The weary traveler who sits down to rest and refresh himself in the "white north" freezes to death, but in the tropics and semitropics you cannot freeze and you cannot starve. The person prematurely aged by those sudden revolutions in the internal economy, engendered by low temperature and violent changes, rapid oxidation and metabolism, whose eliminative organs are crippled and whose arteries are hardened and whose blood pressure is high can come to the semitropics and be sure that his oxidation will be less, his metabolism will be less, and his elimination will increase and his symptomatic blood pressure will approach normalcy. Residence in the semitropics permits a diet of lessened caloric value. Body heat is more easily maintained in an atmosphere which is 75° than in an atmosphere at a temperature of zero or below.

FOOD A FACTOR IN LONGEVITY.

The shortest lived race of people on the earth are the Eskimos, and the longest lived are the Japanese. The explanation of this is purely climatic. Diet is essentially involved and controlled by climate. Eskimos subsist entirely on animal food. Japanese use comparatively little animal food. The principal article of food of the Arabian is dates, and they live to a very old age. Statistics are wanting, but the long life of the Arabian is well known. Arabia, however, can hardly be considered as semitropical climate, inasmuch as the temperature and humidity of the air are so much influenced by the southwest winds of the Desert of Sahara. Food then comes to be a factor of longevity naturally consequent upon climate. That is to say, one must eat to live and his requirements are twenty-five per cent. less in the semitropics than in the northern part of the north temperate zone.

It has been tersely said that "Man is as old as his kidneys," and his kidneys are certainly as old as his arteries. Conservation of the kidneys by cutaneous elimination is a conspicuous phenomenon in all warm climates.

Last and by no means least of factors of longevity in the semitropics is the individual mental condition engendered by residence in a friendly atmosphere, so different from that described and implied in Service's *Spell of the Yukon*. There is less hectic struggle for life where the average man does not have to spend five per cent. of his time and income for wood, coal, wool, and fur, lest he die from lack of them.

The Conservative Treatment of Pneumonia*

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Pneumonia is a selflimited disease, that is, it shows a tendency to spontaneous recovery; Nature can elaborate antigens and immune bodies sufficient to insure recovery in a large proportion of cases. Its intrinsic mortality, however, is high, and that fact, taken in connection with its frequent occurrence and wide distribution, has made it a focus of intense therapeutic activity.

Direct attempts have been made to cure pneumonia by using symptomatic remedies to meet theoretical or forced indications. As examples of such direct treatment may be mentioned bleeding, purging, the "cold air treatment," digitalizing the heart early in the disease, the use of veratrum viride in large doses, and the regular use of antipyretics. The justification of any direct method of treatment which radically interferes with natural processes must lie in its success. What is the status of the direct methods just alluded to?

Bleeding as a routine procedure was employed very generally for centuries; it was used by Hippocrates, whose treatment of pneumonia was otherwise conservative; now it is very little used.

Routine purging in the treatment not only of pneumonia but of most diseases, is still common practice. A belief in the essential therapeutic value of forced catharsis, that is, in the use of artificial evacuants in the absence of natural indications for catharsis, has been one of the obsessions of medicine for ages; but it was not shared by the Father of Medicine, who says in his Second Aphorism: "Artificial evacuations, if they consist of such materials as should be evacuated, do good and are well borne; but if not, the contrary."

Special indications for forced catharsis may appear in pneumonia as in other diseases, just as special indications may appear for bleeding and for other radical interferences with natural processes; but for its routine use in this disease justification would seem to be lacking; especially in view of the unfavorable factors whose development is encouraged by artificially induced catharsis, viz., increased fluidity of the feces, which facilitates the multiplication of intestinal bacteria and the absorption of toxins; disturbances of the physiological adjustments of the alimentary tract, and especially of its lining mucosa, which is the first line of defense against toxemic absorption; and disturbances of the heart, which may be caused by absorbed toxins, abdominal reflexes, and mechanical pressure due to flatulence. That the classical purgation with calomel and magnesium sulphate at the beginning or in any stage of the disease can predispose to tympanites and myocardial depression, is an inference from clinical observation.

The "cold air treatment" is an exaggeration of good ventilation, and is included with the direct methods. The possible therapeutic value of the excessive coldness of the air does not seem great enough to counterbalance the fact that the exposure recommended threatens the patient with relapses and complications if his fever should abate while the treatment is in progress, to say nothing of the inconveniences of the treatment.

Digitalizing the heart early in the disease as a routine procedure was advocated by Petresco a generation ago, but failed then to get much attention; it has recently been revived and quite extensively used. Petresco recommended digitalis in large doses as a specific bactericide, as well as a symptomatic remedy to meet a forced symptomatic indication; its more recent advocates have featured the forced symptomatic indication. I will repeat what I said in a previous criticism of this treatment, that I cannot see how overstimulating (poisoning) the presumably healthy heart muscle early in the course of a pneumonia can make it better able to stand strain later in the disease. Certainly an overwhelming mass of favorable clinical evidence is required to compel serious consideration of such a radical therapeutic dogma.

The use of veratrum viride and similar drugs in large doses to meet the theoretical indication of relieving pulmonary congestion by "bleeding the patient into his arteries," has passed almost completely into desuetude, although at one time it was a very popular treatment.

The routine use of drug antipyretics has likewise become obsolete, after having taken its deadly toll. Routine antipyretic hydrotherapy has still a considerable vogue, in spite of the quite widely accepted theory of the nature of fevers as occurring in bacterial infections, viz., that they are constructive and part of Nature's therapeutic plan. Hyperpyrexia, however, may justify antipyretic hydrotherapy.

Since the discovery of the bacterial causation of acute infectious diseases, attempts have been made to cure pneumonia by drug bactericides and by specific vaccines and serums. A long list of the drugs which have been recommended for specific bactericidal effect in pneumonia can be extracted from the medical literature of the last thirty years. This list includes salicylic acid, quinine, creosote, urotropin, camphor and optochin. Most of the drug specifics for pneumonia have already lapsed into obscurity, and there seems little reason to hope that any bactericide will ever be found that is effective in a general bacterial infection (though the case is different in plasmodial diseases).

The biological specifics belong in a different category from the drug bactericides and the symptomatic remedies used to meet forced indications, inasmuch as their use is in harmony with the natural method of cure, which is by development of immunity. There is evidence to support the general proposition that vaccines can stimulate the production of immunity, and that specific serums can supply this immunity artificially. We have shining examples of successful biological specific treatment in the prophylactic vaccination against typhoid fever and the serum treatment of diphtheria. We hope for, we look for, we expect biological specifics for pneumonia in all its varieties. But have we got them yet?

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SERUM TREATMENT.

Of the biological specific treatments for pneumonia which have been experimented with only one has received much general consideration, viz., the serum treatment for Type I pneumococcus infection which emanated from the Rockefeller Institute Hospital. In support of this serum treatment it has been stated that it lowers somewhat the mortality as compared with other methods of treatment. Cole reports 195 cases treated by this serum in the Rockefeller Hospital with a mortality of 9.2 per cent., and 300 additional cases from the literature, making a total of 495 cases, with a mortality of 10.5 per cent. Irons gives the following figures from the compiled statistics of twenty-two army corps in the field during the period from October, 1917, to March 1, 1918: Total number of cases of pneumococcus pneumonia, 2,953, with a total mortality of 9.9 per cent.; of which 441 were Type I cases treated with the serum, showing a mortality of 9.3 per cent., and of which 195 were Type I cases not treated with the serum, showing a mortality of 9.7 per cent. Practically all of these cases occurred in young men, and were under treatment from near the beginning of the disease. Thompson, from a study of sixty cases of Type I pneumococcus pneumonia treated in St. Luke's Hospital, New York, and 550 cases reported in the literature exclusive of the Rockefeller Hospital series, concludes that Type I pneumococcus pneumonia, however treated, varies much in mortality with time and place, and may not be so frequently fatal as is generally believed to be the case. Of the sixty St. Luke's Hospital cases fifty were treated with the serum. In four of these fifty the course of the disease appeared to be shortened; in eight the serum appeared to have only a transitory effect, and in the remaining thirty-eight the duration and outcome of the disease appeared not to have been demonstrably affected by the serum. The average duration of the fever among the serum treated cases was nine and a half days, and among those of the series not treated specifically, eight and two tenths days. Serum sickness occurred in thirty-six of the fifty serum treated cases.

The reports so far received of the results of treatment of Type I pneumococcus pneumonia by this serum do not seem sufficient to establish its claim to be considered an effective biological specific; and the serums which have been proposed for infections with other types of pneumococcus, as well as the pneumonia vaccines, are of lesser authority.

CONSERVATIVE TREATMENT.

If we have no direct means of curing pneumonia, we can still do something to help the patient by conservative treatment. Conservative treatment means doing what is necessary and possible to put and keep the patient in the condition most favorable for the operation of the natural method of cure which has been developed through ages of evolution, and avoiding doing anything which might interfere with Nature's method. Conservative treatment permits to a certain extent direct alleviation of unpleasant and dangerous symptoms, and does not forbid the use of extraordinary procedures in desperate conditions.

The plan of treating pneumonia which I have developed during my experience of thirty years approximates to the conservative ideal. This plan became fairly well crystallized about ten years ago, and I have published it on several occasions. Its main features may be summarized as follows:

HYGIENE.

Hygiene is regarded, and fresh air provided, but the patient is carefully protected from exposure to cold when the temperature is down. The fever is looked on as constructive, and is not treated unless excessively high, when tepid sponging is allowed.

DIET.

A particular and definite diet is given, which is specially arranged to safeguard against dangers which threaten from the alimentary canal. It is fluid and lactovegetarian in character; it is restricted in protein and fuel to somewhat less than the minimum health ration (in view of the shortness of the disease); it supplies extra rations of alkalies to counteract the tendency of acidosis, and of calcium to offset the tendency to shortage of that necessary element; and water in abundance. In the form generally prescribed, this diet supplies daily three pints of a two to one milk and barley water mixture, nine ounces of strained orange or grapefruit juice, two ounces of lactose, and one and a half drams of sodium bicarbonate and one half dram of calcium chloride, in excess of those salts in the other food; and water to exceed ninety ounces. This diet is changed to suit conditions. Different modifications of milk are substituted for the milk mixture; if there is tympanites or diarrhea, the diet is reduced to barley water, salts, lactose and fruit juice, or to water and salts alone; in critical conditions generally the diet is similarly reduced; and if there is great weakness of the heart the fluid intake is restricted.

CATHARSIS.

A feature of this plan of treatment which is particularly distinctive because of its variance from common practice, is extreme conservatism in the use of artificial evacuants. Cathartics or enemas are not given during the active period of the disease unless special indications for them appear. With the diet outlined above, which makes for preponderance of acidophilic over saprophytic bacteria in the intestine, (and with avoidance of medication disturbing to the alimentary tract), it has been found possible to let the bowels remain unmoved for several days or even a week or more without bad consequences appearing, and with apparent safeguarding against dangers which regularly threaten from the alimentary canal; as a rule, the abdomen remains soft and flat, and tympanites is observed less often than when routine catharsis is practiced. Often the bowels move of themselves, and such natural evacuations appear less disturbing to the patient than those which are artificially induced. If tympanites should develop which is not relieved by reduction of diet, a simple or a fel bovis enema is given; and a simple enema is sometimes given if the patient complains of a sense of fulness in the rectum, which, however, does not often happen; and usually, if the patient is seen early in the disease and a bowel movement has not taken place within twenty-four hours, an enema or a mild cathartic is given; and in children a dose of castor oil is usually given early in the disease; and on the second day after defervescence an enema is regularly given if the bowels have not moved spontaneously.

HEART STIMULATION.

Stimulation of the heart is given purely for symptomatic support, that is, only when needed and as nearly as possible to the extent needed; but in the later stages of the disease, or when the need for stimulation is very great, the danger of overstimulation is less closely regarded than in the earlier stages or when the demand for stimulation is moderate. The stimulation is given according to a definite but flexible program. The heart stimulant drugs generally used are strophanthus, preferably in the form of the amorphous strophanthine, strychnine, and caffeine. Strophanthus is the chief reliance. It is preferred to digitalis, which it closely resembles in its action on the heart, because of the following advantages which it possesses over that drug: It is more manageable in its doses; it is more prompt in its action, and, being quickly eliminated, is free from the danger of cumulation; and it does not so regularly disturb the alimentary tract. The dose of strophanthus which I have found most effective is much smaller than that recommended in most of the textbooks. My ordinary range of dose of the tincture of strophanthus is from one and a half to three minims, given every four hours, and of strophanthine amorphous, one one thousandth of a grain to one two hundred and fiftieth grain, given every four hours, by deep hypodermic injection or sublingually, never by mouth to be swallowed. A single dose of one one hundredth of a grain of the strophanthine is sometimes given in cases of extreme cardiac failure, but after that no more of the drug is given for twenty-four hours. The average full dose is one five hundredth grain every four hours, and it is not often necessary in pneumonia to exceed this dose, but with severe symptoms of cardiac weakness the dose may be temporarily increased to one two hundred and fiftieth grain. In many cases one one thousandth grain every four hours gives all the stimulation needed. Strychnine sulphate, in doses of one sixtieth grain every four hours, by mouth or hypodermic injection, and caffeine sodiobenzoate, in doses of two grains every four hours, are used as accessory heart stimulants. In the comparatively rare cases which do not take strophanthus well, digitalis is used in corresponding doses, but it is considered the second choice as a heart stimulant in this disease. Not every case of pneumonia in adults receives heart stimulation, and in children with this disease heart stimulation is very seldom given.

RELIEF OF OTHER SYMPTOMS.

Symptoms other than that of cardiac failure are often treated, but always with regard for the conservative ideal. For severe pain in the chest early in the disease, hot poultices are sometimes applied, and even opiates in small doses given, but opiates are regularly avoided in the latter stage of the disease, and especially near the expected time of the crisis, when the patient may find it necessary for his salvation to breathe rapidly. Expectorants are not given, although to relieve a very distressing cough early in the disease, small doses of opiates are sometimes allowed. For delirium, constant watching and physical restraint are preferred to sedative drugs, although in exceptional cases such drugs are not withheld. In the aged and in alcoholic subjects whiskey in small or moderate doses is usually given.

The plan of treatment outlined above, with its regard for hygiene, its special diet, its extreme conservatism in the use of cathartics, its special program of symptomatic heart stimulation, and its conservative relief of distressing and dangerous symptoms, has been regularly used by the writer since the beginning of the year 1913. The only reports which he has in shape to present of its use are of hospital cases.

A series of 218 cases diagnosed as primary lobar pneumonia or pneumonia of the influenzal type, came into my service in the Norwegian Hospital, Brooklyn, N. Y., in the period of five and one half years between January 1, 1913, and July 1, 1918. This series was a continuous one in that it included all of the cases of the disease which came into this service in that period. It included those which were brought into the hospital late in the disease and in poor condition, moribund cases, and those which died soon after admission and were not seen by me. The mortality in this series was 18.8 per cent.

MORTALITY STATISTICS.

It is instructive to compare the mortality of this series of hospital cases with that of another series in my service in the same hospital during the period of six and two thirds years immediately preceding the date, January 1, 1913, at which the series mentioned above began. In the earlier series the mortality was 30.6 per cent., as compared with the 18.8 per cent. in the later series. The general character of the cases in both series was about the same: they were mostly public service cases brought to the hospital by the ambulance and sailors from ships in the harbor; and the periods covered were of nearly the same length. The particular point of difference appears in the treatment. In the earlier series the treatment was less conservative than in the later series, especially in regard to the diet and the avoidance of artificially induced evacuations of the bowels.

During the year 1921 seventy cases of pneumonia came into my service in the same hospital. One of these patients jumped out of a window in delirium and fractured his skull, and one signed a release and left the hospital before recovery. Of the remaining sixty-eight patients, fifty-nine recovered and nine died, giving a mortality rate of 13.2 per cent. Of the nine deaths, three occurred in patients who came into the hospital in a moribund state and died within twelve hours, and were not seen by me. The average duration of the fever in fifty-six of the fifty-nine patients who recovered was 8.1 days.

The statistics of these few hospital cases are given for what they may be worth in support of the thesis of this paper, which is, that in the present state of our knowledge we are justified in treating pneumonia conservatively.

1218 Pacific Street.

A Roentgenological Contribution to the Diagnosis of Spinal Carcinoma in Cases Having an Unrecognized Primary Focus

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The brief report of the following two cases will serve to illustrate the radiodiagnostic possibilities in those obscure cases of spinal metastases in which an early correct diagnosis usually is impossible, owing to the apparent absence of a primary focus and to the well known fact that these cases in their earliest development present a very ill defined clinical picture. A comparison of the x ray findings with those of the clinician and the pathologist, together with a special consideration of the early symptoms, might be of great interest to the general practitioner, because as a rule it is the latter through whose hands practically all these cases pass first.

The vagueness of the early symptoms of spinal carcinoma makes us understand why one feels reluctant in making a diagnosis so unfavorable to the patient without at least having a firmer basis upon which to rely for his conclusions. Yet if we realize that in conditions of this kind the late diagnosis is of no benefit to the patient and that a possibly successful outcome depends upon a very early diagnosis, we will be tempted to seek an early recognition of the disease even if it occasionally be at the expense of a diagnostic error.

CASE I.—Bernard K., fifty-two years old, Russian, was admitted to the Montefiore Home, December 16, 1915; died on May 6, 1916. He was an iron worker, was married at forty, but had no children. His previous health had been good, venereal disease was denied. The onset of his illness was sudden, coming on two years prior to admission to the Montefiore Home with cutting pain in left lower extremity while lifting a heavy object. This pain subsided after a few hours. During the following six months there were intermittent pains varying greatly in intensity and duration. Intervals of perfect health alternated with such of more or less marked suffering. Objective findings were negative.

During that period of six months the patient was treated by private physicians and at various dispensaries for socalled sciatica, muscular rheumatism and spinal tuberculosis, with various liniments, massage, packs, etc. During each free interval the patient was declared "cured," the successful result being ascribed each time to a different therapeutic measure. Six months after the onset of symptoms similar pains in right lower extremity also appeared gradually. The clinical diagnosis was tuberculosis of the spine. The patient was placed in a plaster jacket for six weeks with no relief. On the contrary, the attacks of pains, felt in both lower extremities excepting the feet, were more frequent and more violent. Lying in bed on his side gave the patient some relief. Occasionally a sudden movement caused cutting pain in the lower lumbar region. There was only a very slight impairment of the gait during the free intervals, no symptoms referable to the urinary bladder, and no objective clinical findings. This condition persisted for about eighteen months, during which period the course of the disease again was characterized by marked remissions. Gradually the patient's ability to work had disappeared and he became a constant visitor to different dispensaries until at the end of the second year, on December 16, 1915, he was admitted to the Montefiore Home.

Status twenty-four months after onset of the symptoms: Elderly man, medium sized, strongly built, of more than normal weight, with a very pale complexion, who walked somewhat cautiously with the aid of a cane. At times he seemed to experience pain. Head, lungs, abdomen and genitals were negative. Thyroid gland was not enlarged, and the regional glands were not palpable. Neurological examination showed slight restriction of motion in left hip without appreciable pain; left knee jerk diminished, right exaggerated; no Babinski; no sensory, vasomotor or trophic disturbances; no stiffening or deformity of the spine, nor any tenderness on pressure over the lumbosacral region. Laboratory findings regarding blood, urine and Wassermann were negative. On the ground of these findings the case was regarded as of functional origin and placed under further observation.

Twenty-five months after onset of the symptoms: The pains, while previously of a diffuse type, involving first the left and later on also the right lower extremity, had become more localized in the region of the lower lumbar vertebræ. Axial rotation of upper part of the trunk with feet fixed caused sharp pain in the lumbosacral junction. There was distinct tenderness on strong percussion over the lower lumbar vertebræ. Abdominal and cremasteric reflexes were normal. Left knee jerk was hardly obtainable, right exaggerated. No Babinski and no sensory disturbances. Moderate hardening and enlargement of prostate was noted on palpation. A radiographic examination of the lumbar spine was advised.

A radiographic examination was made on January 27, 1916, with the following result: Lumbar spine showed increased porosity of left half of fourth lumbar vertebra; outline of left border of that vertebra slightly indistinct as compared with the right border. The other parts of the skeleton, x rayed as a routine procedure in obscure cases, were negative. The x ray diagnosis was, possibility of organic lesion involving left half of fourth lumbar vertebra. The lumbosacral spine being markedly obscured by gas in the intestine, a reexamination after a more thorough preparation of the patient was advised.

The radiographic reexamination was made on

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*Demonstrated before the New York Academy of Medicine, Section of Neurology, March 8, 1922.

February 4, 1916, and the findings regarding the fourth lumbar vertebra were the same as before (Fig. 1). Lateral examination of lumbar spine was unsuccessful owing to patient's obesity. A brief fluoroscopic examination of the respiratory and alimentary tracts was negative. Diagnosis was possibly neoplasm of fourth lumbar vertebra; primary focus not revealed.

The patient was referred to the department of mechanotherapy for treatment. Treatment was continued for about six weeks with "occasionally some good results." Six weeks after the beginning of the mechanotherapeutic treatment and twenty-seven months after onset of the symptoms the patient experienced sudden violent pain in the lower part of his back and in both lower extremities. Even the slightest movement caused extreme suffering. Left knee jerk was entirely absent. The patient was bedridden and a röntgenological reëxamination was advised.

A radiographic examination on April 20, 1916, showed complete destruction of left two thirds of the fourth lumbar vertebra and of small adjoining portions of the third and fifth vertebral bodies (Fig. 2). Examination of the rest of the skeleton and fluoroscopy of respiratory and alimentary tracts was negative. Diagnosis, neoplasm involving the fourth and adjoining portions of the third and fifth lumbar vertebræ; primary focus not revealed.

On May 2, 1916 (twenty-eighth month after onset of symptoms), the condition was as follows: Retention of urine and feces; severe pain on palpation over lumbar vertebræ; pain in lower back and lower extremities gradually became constant and could scarcely be controlled by opiates; left knee jerk and both Achilles reflexes absent; sensory disturbances; anesthesia, analgesia and thermanesthesia corresponding to L4-S5; loss of sense of locality in left lower extremity; prostate apparently enlarged. Clinical diagnosis: Metastatic carcinoma of lower lumbar spine with primary focus probably in the prostate.

The further course of disease showed rapid loss of weight, rapidly progressive cachexia, and the patient died on May 6, 1916.

AUTOPSY FINDINGS.

Autopsy was performed by Dr. S. B. Kline. The findings were as follows: Spinal column straight without any external deformities; almost entire fourth lumbar vertebra and adjoining portions of third and fifth vertebral bodies replaced by tumor tissue which on cross section appeared reddish gray and which microscopically later proved to be adenocarcinoma; tumor mass compressed spinal cord, but did not penetrate meninges; no evidence of new bone formation; small subdural hemorrhage in left third lumbar nerve root; usual staining methods showed slight gray atrophy in several spots of lumbar and sacral segments of spinal cord, and in nerve roots of cauda equina. Prostate normal, in its neighborhood an accumulation of a large amount of fat. Thyroid, lower portion of right lower lobe moderately enlarged containing on section a well encapsulated tumor of the size of a hazel nut which later proved to be adenocarcinoma. The other organs were negative.

Case II.—Mrs. E. S., Austrian, sixty years old, married, seven children, was admitted to the Montefiore Home on April 9, 1917, and died April 30, 1917.

Onset of symptoms: Eighteen months prior to admission to Montefiore Home, she experienced sudden pain first in the right ankle, later in the right knee. This pain was in the form of paroxysmal attacks varying considerably regarding frequency, severity and duration. She had been treated by private physicians for muscular rheumatism without noticeable improvement, and after about four months the painful attacks ceased "spontaneously." During the following three months the patient felt perfectly well and was able to do her house work.

Seven months after onset of symptoms: Suddenly, while lifting something heavy, she experienced violent pain in the right knee associated with slight pain in the lower back. The pain radiated down the right lower extremity, running first along the posterior then along the internal surface of the leg, and ending in the malleolus internus. She grew gradually worse, and after a few days was unable to walk. There were no objective findings. She was treated for rheumatism, sciatica, and hysteria. For a short time she was admitted to a hospital where she was treated with mechanotherapy without favorable results.

Twelve months after onset: Patient's condition was growing worse. She was unable to sit up and pain was also felt in left lower extremity. A privately conducted x ray examination revealed a pathological condition of the lumbar spine interpreted as tuberculosis. The patient was put in a plaster cast which had to be removed after six weeks on account of pain.

Sixteen months after onset: Sudden hematuria occurred with violent pain in the lower abdominal region. A private physician diagnosed neoplasm of the bladder and advised operation. Patient was brought to the hospital and bleeding from the bladder was arrested. A radiographic examination of the lower spine showed a destructive process in the lumbar vertebræ interpreted (correctly) as neoplasm. Clinical findings, however, being in favor of spinal tuberculosis, the latter diagnosis was agreed upon and patient was transferred to the Montefiore Home on April 9, 1917.

Status on admission, eighteen months after onset of symptoms: The patient, a medium sized, elderly woman, was emaciated, extremely cachectic, and apparently suffering great pain. The slightest movement causing extreme suffering, a thorough examination was impossible. Findings: Slight, markedly tender, round gibbus on level of third to sixth thoracic vertebræ; another large, round, extremely tender gibbus involving the lumbar region; oval shaped, slightly tender, moderately hard, nonmovable protuberance, the size of a hen's egg, in region of right frontoparietal region; clinical picture of a complete transverse myelitis corresponding to level of seventh dorsal segment; slight resistance and moderate tenderness on palpation over midgastric region; no enlargement of regional glands; no tumors palpable in mammary glands. Laboratory findings: Hemoglobin, 65 per cent.; red blood cells, 5,000,000; blood pressure, 130/80; urine and Wassermann examinations, negative; temperature, 101°; pulse, 110; respiration, 30.

A radiographic examination showed almost complete destruction of lumbar in the vertebræ. There were fine, somewhat irregular defined shadows within the soft parts along both sides of lumbar spine, suggestive of being due to enlarged transverse processes of the vertebræ. Other, smaller shadows within the soft parts, were suggestive of lime deposits. Smaller and larger areas of bone destruction were scattered throughout bodies of thoracic vertebræ, especially in midthoracic region. Cranial bones were studded with bone defects of various sizes. To the above mentioned tumor in the right frontoparietal region corresponds a large oval shaped area of bone destruction. There were numerous areas of irregular bone destruction in pelvic bones and upper portions of both femora. A brief fluoroscopic examination of respiratory and alimentary tracts was negative. Diagnosis: General carcinomatosis of osseous system; primary focus not revealed. Clinical diagnosis: Metastatic carcinoma of the spine with primary focus probably in the stomach. The patient's condition grew gradually worse and she died on April 30, 1917.

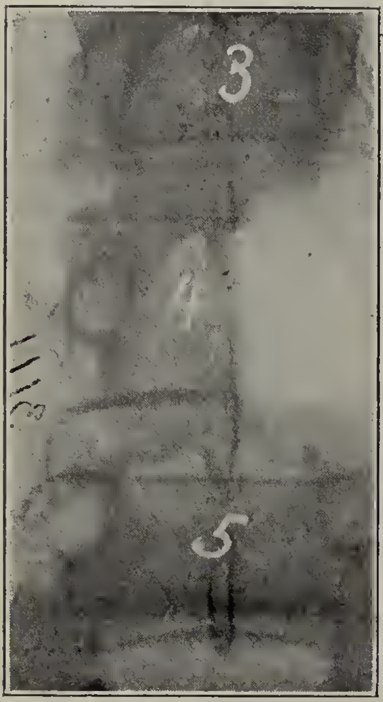

FIG. 1.

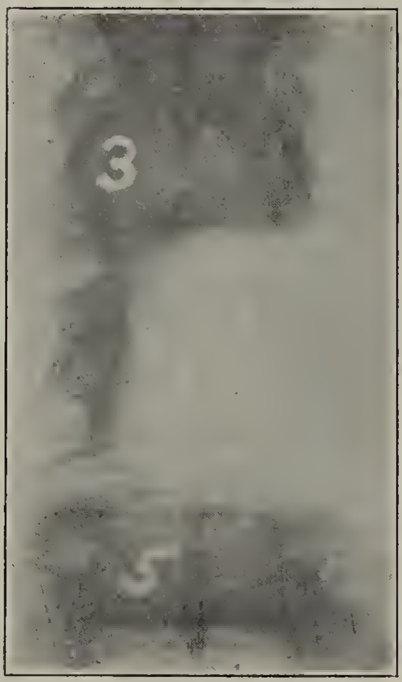

FIG. 2.

FIG. 1.—Radiogram of lower lumbar spine of patient in Case I, showing fine rarefaction of left half of body of fourth lumbar vertebra.

FIG. 2.—Radiogram of lumbar spine of patient in Case I taken about six weeks later than Fig. 1, showing almost complete destruction of the body of the fourth lumbar vertebra and of small portions of the adjoining two vertebrae.

AUTOPSY FINDINGS.

Spinal column as a whole was brittle and porous. Transverse processes of lumbar vertebræ were greatly enlarged and to a great extent replaced by grayish white fleshy tumor masses, which latter extensively invaded the adjoining soft parts. Similar changes were found in the spinous processes and the bodies of the lower thoracic and lumbar vertebræ so that the entire portion of the spine appeared to be transformed into one thick longitudinal tumor mass within which were seen thin shells of bone and small areas of calcification. Anterior portions of upper lumbar vertebræ were greatly enlarged so that bodies of those vertebræ were projecting forward into the abdominal cavity. Ligamentum anterius was bulging forward, but was not penetrated by tumor masses. Thoracic vertebræ showed smaller and larger foci of bone destruction, especially the fourth and fifth vertebræ, the larger part of which were replaced by tumor tissue. Spinal cord was compressed in many places, especially on the level of fourth and fifth thoracic vertebræ. Other portions of the spinal cord failed to present evidence of compression in spite of the fact that they were densely surrounded by tumor masses. Dura was nowhere penetrated. Upper portions of both femora and especially the cranial bones showed numerous small and large carcinomatous foci. Within the upper portion of the left femur shaft there was a moderately large cystlike cavity the contents of which later on failed to reveal any carcinomatous tissue. In a search for the primary focus the stomach, intestine and the other organs were found negative. Finally, sections through the left mammary gland revealed the presence of a tumor the size of a hazel nut, which later on proved to be a carcinoma.

REVIEW.

It may be of general interest to recapitulate briefly the salient features of the clinical, radiographic and pathological findings in these two cases, and then draw our final conclusions. As the lumbar and sacrolumbar regions are the most frequent seat of metastatic carcinoma our conclusions will apply to the vast majority of spinal metastases. An occasional pointing out of diagnostic errors made by others should not be interpreted as a reflection upon the diagnostic ability of other examiners, because we all make mistakes and it is from the discussion of such mistakes that we learn more than from instances of a brilliant diagnosis.

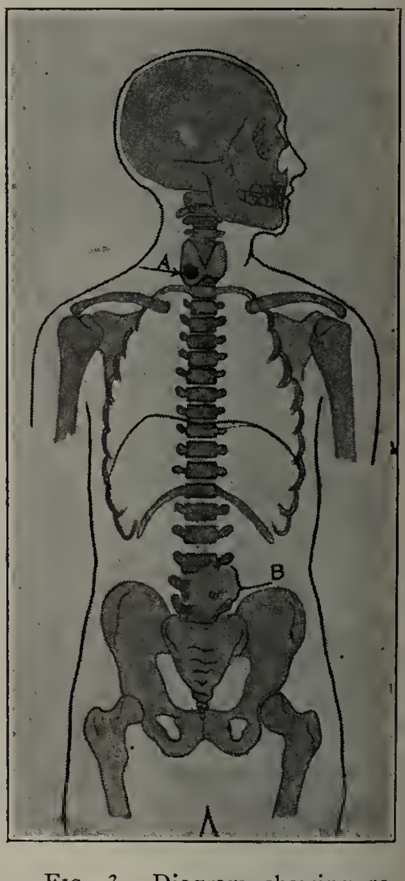

FIG. 3.—Diagram showing relation of primary focus in the thyroid (A) to the secondary lesion (B) in the lumbar spine. (Case I.)

Clinically by far the greatest part of the course of the disease in both instances was completely dominated by one single subjective symptom, namely pain, and was characterized by marked remissions of sometimes long duration. Objective findings were entirely absent during that period. These appeared comparatively late in the disease, and still later spinal cord symptoms appeared. This marked disproportion between subjective and objective findings, together with the remissions, are the reasons why comparatively little attention is as a rule paid in general practice to the earlier periods of the disease and why occasionally cases of this type are diagnosed as hysteria or malingering. The most frequent diagnoses, however, made in such conditions are neuritis, muscular rheumatism and sciatica. The latter reminds us of Charcot's word that in elderly people unilateral sciatica is suggestive, and bilateral sciatica is pathognomonic of neoplasm of the lumbar spine, a rule so well borne out by our two cases.

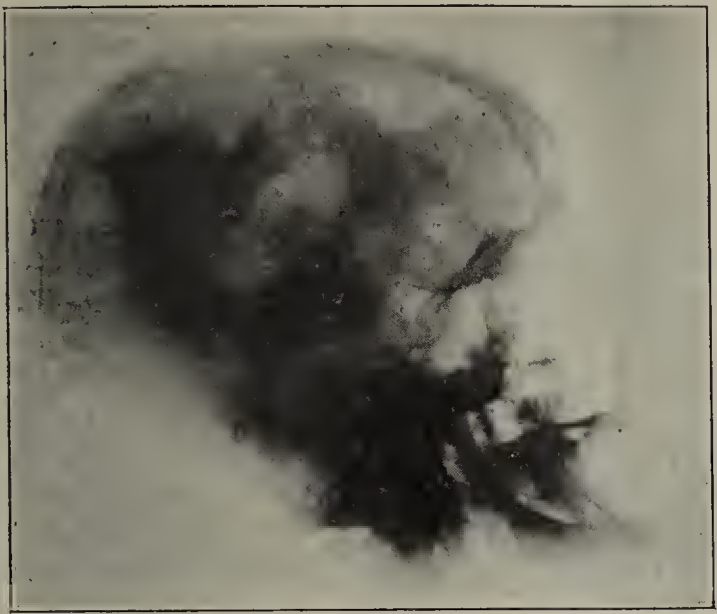

FIG. 4.—Radiogram of skull of patient in Case II showing multiple small and large metastatic foci.

Of great interest to both clinician and röntgenologist is the explanation by the autopsy findings of the round gibbus in the second case. It was found that the gibbus was not due to collapse of vertebral bodies as is the case in spinal tuberculosis, but was caused by enlargement of the spinous processes produced by metastases in the latter. The gibbus in this case, therefore, had to be round, while that in spinal tuberculosis is necessarily sharp. This important differential diagnostic point has been brought out by various writers in the past and our other abundant carcinoma material seems to confirm our opinion that in spinal carcinoma there practically never is found any collapse of the vertebral bodies, no matter how far advanced the destructive process might be. Where such an occurrence has been described evidence invariably seemed to point to the probability that the vertebral collapse has been caused by postmortem manipulations.

The röntgenologist will derive a very important lesson from the autopsy findings in these two cases, showing him the value of lateral views of the spine. Both metastatic involvement of spinous processes and collapse of vertebral bodies may be demonstrated radiographically and an important differential diagnostic point may thus be furnished to the clinician.

The question of primary focus was a puzzle to the clinician and röntgenologist and, in the second case, also to the pathologist. The clinical assumption of the prostate being the seat of the primary lesion in the first case was disproved by the autopsy which revealed a primary carcinoma of the thyroid. The radiographic evidence in the form of a small localized destructive lesion spoke against the probability of carcinoma of the prostate, because in the latter metastases invariably take the form of a diffuse osteoplastic type gradually involving the entire skeleton causing a radiographic picture somewhat similar to that found in cases of ostitis fibrosa.

Still more complicated were the conditions in the second case. Here, clinically, the seat of the primary lesion was placed in the stomach owing to the tenderness and resistance found on palpation over the gastric region, while the radiographic findings regarding the alimentary tract were negative. The autopsy gives an interesting explanation of these contradictory clinical and röntgenological findings. The anterior portions of the lumbothoracic vertebral bodies were found so greatly enlarged that they were projecting into the abdominal cavity. The clinician's hand, therefore, in palpating the patient's abdomen was pressing upon those enlarged vertebral bodies. This explains the tenderness as well as the resistance. Though a complete röntgenological examination failed to reveal the nature of the primary lesion, the rapid and diffuse spreading of the secondary changes strongly suggests the probability of the original focus being in the breast. Yet no tumor was revealed in either breast even by careful palpation. And even the pathologist during the autopsy met with difficulty in his search for the primary focus and finally found it only by means of thin sections through the mamma.

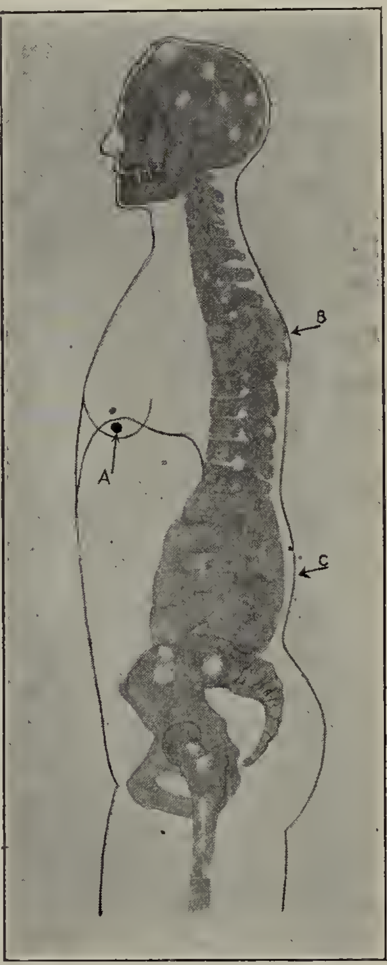

FIG. 5.—Diagram showing the extent of the metastatic involvement in Case II. Note the two gibbus formations caused by enlargement of the spinous processes, the tumor in the parieto-frontal region caused by a large metastatic growth. Note also the bulging forward of the lumbar spine due to enlargement of the bodies of the vertebræ, and the very small primary focus in the breast. A primary focus; B, small gibbus; C, large gibbus.

One might therefore note with some interest that malignant foci situated comparatively superficially may escape detection on physical examination and that such a small nonpalpable tumor may give rise to the most extensive metastatic involvement. One may furthermore take into consideration that the demonstrable röntgenological character of the secondary lesion in such obscure cases may, to a certain degree, throw some light upon the nature of the primary focus, if we remember that carcinoma of both the prostate and the breast, in contrast to other types of primary lesions, metastasize in a rapidly progressive, very diffuse form soon involving practically the entire skeleton and presenting a combination of an osteoplastic and osteoclastic type of bone lesion. In the prostatic form the osteoplastic elements by far predominate causing a röntgenological picture suggestive of ostitis fibrosa, while in the mammary form the osteoclastic type is more in evidence.

In view of the great multiplicity and variety in size of the spinal metastases in the second case the latter was considered a good opportunity for comparative studies regarding the antemortem and postmortem demonstrability of metastatic foci of the spine. For that purpose radiograms were taken of the entire spine before and after the patient's death and of the removed specimen. The radiographic findings then were compared with those of the pathologist. The result of those comparative studies may briefly be stated as follows:

All macroscopically well recognizable superficial foci of about half a centimetre in diameter or more were demonstrated radiographically antemortem if they were situated along the inferior and superior borders and especially along the lateral aspect of the vertebral body. Foci up to about one centimetre in diameter were not visualized on the antemortem radiograms if they were situated along the anterior or posterior surfaces of the vertebral body, within the vertebra or in its pedicles.

Radiograms of the removed specimen and especially after this specimen had been divided by a longitudinal section, gave the finest and most complete demonstration of all the macroscopical foci even of the most minute ones. The pathologist on the other hand was able to recognize all the superficially situated foci. Of the foci situated within the bone only those were recognized which were struck by the field of section, while those outside of the field of section were missed.

We may therefore infer from these statements that a negative x ray examination of the spine does not exclude the presence of a metastatic focus or foci; that reexaminations at certain intervals may succeed in demonstrating a gradually growing focus; that the employment of the x rays by the pathologist in his search for bony metastases is of prime importance.

While in the first case the metastatic involvement was strictly localized within the region of the fourth lumbar vertebra, the other parts of the skeleton being free, the second case shows us the importance of radiographic examinations of the entire bony system in instances of suspected metastases to the spine. The radiographic evidence of multiple areas of bone destruction in the pelvic bones and the upper parts of the femora greatly strengthened the x ray diagnosis of spinal metastases. Furthermore, radiograms of the skull showed the latter riddled with small and large metastatic foci. Of especial interest in this connection is the presence of the above mentioned tumor at the parietofrontal region which, according to the patient's statement, had made its appearance as early as nine months prior to the patient's admission to the Montefiore Home and which the autopsy proved to be due to a large metastatic bony focus with secondary involvement of the neighboring soft tissues. And yet no one seemed to have been keen enough to realize the importance of an x ray examination of the skull in this case, an examination the findings of which definitely clinched the diagnosis of neoplasm. One sees, therefore, how important it is for the röntgenologist not to confine his examination to the part of the spine called for by the clinician, but arrange his radiographic procedure according to the clinical aspect of the individual case, including his investigation into any part of the body which might contribute to the solution of the diagnostic problem. In this connection attention should be called to the great frequency of metastases in the skull and upper parts of femora, changes which, as a rule, cause neither subjective nor objective symptoms.

Attention may finally be called to the cyst in the upper part of the left femur in the second case, the contents of which failed to reveal any carcinomatous material. The occurrence of such apparently noncarcinomatous cysts in connection with metastatic carcinoma of the osseous system has been elaborately dwelt upon by Tscherniakowsky. This feature is an interesting one, inasmuch as one can easily see how the presence of such cysts may lead the pathologist to arrive at wrong conclusions.

CONCLUSIONS.

Early diagnosis of spinal metastasis in cases showing no apparent primary focus is very difficult. It may be arrived at by means of a thorough and careful analysis of its only symptom, pain, and a careful observation of the course of the disease with its characteristic remissions.

Presence of a round gibbus strongly speaks against spinal tuberculosis.

Sciatica in elderly people, especially if bilateral, is suggestive of neoplasm of the lumbar spine.

Radiographic examinations may prove to become of great diagnostic help early in the disease.

They should be made repeatedly and should be arranged individually according to the clinical aspect of the case.

They should not be limited to the part of the spine called for, but should include the entire spine and such other parts of the body as may be suspected of having some bearing upon the diagnosis, especially skull and upper parts of the femora.

The radiographic appearance of the metastatic changes may give a suggestion regarding the true nature of the unknown primary focus.

Mechanotherapy seems to be very harmful in cases of spinal metastases and should therefore be made use of with great care in spinal conditions.

An early diagnosis in spinal carcinoma may give hope of a cure in cases like our first one, where the secondary involvement was solitary and comparatively small and the primary focus, if recognized, could have been removed surgically. Deep x ray therapy in such cases may save the patient's life.

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858 Lexington Avenue.

Diagnosis of Subacute and Chronic Inflammatory Lesions of the Mucosa Lining the Maxillary Antrum of Highmore*

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New York.

There are cases of subacute and chronic inflammation of the mucosa lining the maxillary antrum which have been a source of trouble in arriving at a diagnosis. The salient features of these cases are in the following factors: 1. Their clinical histories lead to a suspicion of maxillary antrum involvement. 2. The x ray picture gives a shadow over the affected antrum. 3. When punctured the washings are clear.

The procedure that has been employed in the diagnosis in cases of this type, the use of the nasopharyngoscope has been touched upon by some workers, among them Skillern. Antroscoping, or looking into the maxillary sinus, is accomplished by puncturing the antrum in the usual manner and inserting the nasopharyngoscope through this opening.

METHOD.

The inferior meatus is cocainized and adrenalized by packing left in for five to ten minutes. The antrum is punctured as far anteriorly as possible. The straight trochar and cannula was found most suitable for this work. The antrum is punctured with the trochar held at an angle of thirty degrees to the outer nasal wall or base of antrum, thereby making a slitlike opening through which the nasopharyngoscope can be passed with greater ease. After puncturing, the trochar is removed and the nasopharyngoscope immediately introduced through the same opening and the antrum inspected. Inspection of the antrum must be done rather quickly, as bleeding soon begins and obstructs the view. Also prolonged instrumentation of the maxillary antrum causes a marked congestion of the lining membrane which interferes with the examination. In the subsequent examinations, however, these disturbing features are not encountered, as the antrum becomes accommodated to instrumentation.

A special straight trochar and cannula is being made, to enable the operator to puncture the antrum, withdraw the trochar and insert the nasopharyngoscope through the cannula into the antrum, so as to prevent the lamp and lens from being soiled with blood.

In using the nasopharyngoscope one must learn to interpret the picture which the lens presents, as there is a certain amount of enlargement and blurring due to the focal length of the lens. The results described in this preliminary report were found by the use of the old type nasopharyngoscope. The new instrument being constructed will overcome the disadvantages of the Holmes instrument as found in connection with this work. It will be of a smaller calibre and straight in its entire length so as to make also the frontal and sphenoid sinuses accessible.

The following four cases briefly outlined will demonstrate the value of this method of diagnosis:

Case I.—Patient M. K., gave a history of frequent colds in the nose, accompanied by a discharge mostly from the left nares. Rhinoscopical examination revealed the left nares filled with mucus; no other pathological findings were present. The x ray examination showed the left antrum to be slightly cloudy; the other sinuses were negative. After clearing the nose, the left antrum was punctured and washed, and the fluid returned clear. Antroscopy of the left maxillary sinus showed marked congestion of the mucous membrane with areas of polypoid degeneration and large polypi on the orbital, facial and zygomatic surfaces of the antrum. Following irrigations the discharge almost disappeared, the lining membrane took on a healthier appearance, but the polypi still remained. The patient felt greatly improved and was reluctant to continue treatment.

The condition may remain quiescent as a low grade process for any length of time, but the antrum is subject to acute exacerbations with onset of a fresh infection. With degenerative changes in the mucous membrane and polypi already present, it appears that a radical operation is here indicated.

Case II.—Patient B. S., presented herself on August 8, 1921, with the history of a constant discharge from the left nares. Rhinoscopical examination revealed the left nares filled with a thick purulent secretion. Nothing else pathological was found. The x ray showed a clouding of the left maxillary sinus. Before puncturing, the nose was cleared of residual pus. No free pus was obtained on puncture. Washings returned with a few flocculent pus particles. Antroscopy revealed marked polypoid degeneration of the mucosa lining the antrum. The opening into the antrum was subsequently enlarged and some of the polypi removed for examination. They were found to be analogous pathologically to polypi arising from the ethmoids or turbinates.

This patient had been under observation and treatment for four months. Subsequently she had improved, there being little discharge from the nose present. However from a direct view obtained with the nasopharyngoscope of the condition of the antrum, it was noted that in spite of the treatment the antroscopic picture had remained unchanged, and one concluded that nothing but a radical operation could ever cure this patient.

Case III.—The patient I. T., presented herself at our clinic September 23, 1921, with the history of attacks of pain in the left side of the face for the past three years. The pain was intermittent in character, at times radiating to the left ear, and was at times so severe that the patient felt as if her teeth were being pulled. There was no history of nasal discharge or colds. X ray examination of the accessory sinuses showed slight clouding of the left maxillary antrum. Antrum puncture and washings gave negative results. The fluid returned clear. Antroscopic examination revealed extensive polypoid degeneration with large overhanging polypi, from the facial, orbital and zygomatic surfaces of the antrum. As much as could be made out of the nasal surface, no polypi were visible on it. The cavity itself was free from any secretion.

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*Read before the Section in Laryngology, New York Academy of Medicine, November 23, 1921. From the Otolaryngological Department of Beth Israel Hospital, Service of Dr. Samuel J. Kopetzky.

On October 25th I operated on this patient doing the classical Caldwell-Luc operation under general anesthesia, assisted by Dr. A. A. Schwartz. On opening into the antrum the latter was carefully examined with the nasopharyngoscope before curetting, in order properly to interpret the preoperative findings. The findings were corroborated by locating the presence of numerous large and small polypi, also polypoid changes throughout the lining mucous membrane of the antrum, excepting the nasal surface where only thickening and edema were noticed.

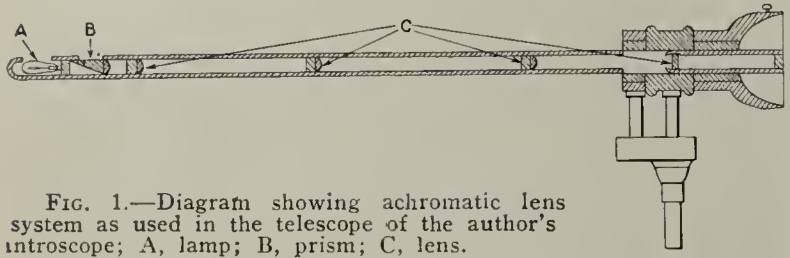

Fig. 1.—Diagram showing achromatic lens system as used in the telescope of the author's introscope; A, lamp; B, prism; C, lens.

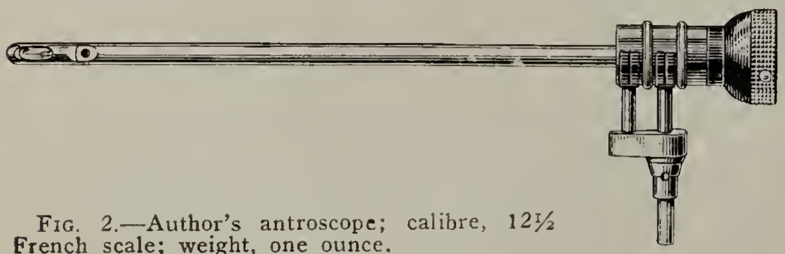

Fig. 2.—Author's antroscope; calibre, 12½ French scale; weight, one ounce.

The antrum was then thoroughly curetted, the specimen saved for pathological examination and operation completed in the usual manner. (The pathologist reported chronic inflammation with polypoid degeneration of the mucosa.) The postoperative manner of healing in the antrum was observed and studied continually with the aid of the nasopharyngoscope.

Case IV.—Patient T. T., presented himself at our clinic October 28th, with the history of marked nasal obstruction for many years accompanied by headaches and frequent colds. The patient had a thin watery discharge from the nose. Rhinoscopical examination showed marked irregular deviation of the nasal septum to right and left, marked ridge of vomer to left. Before advising a correction of the nasal septum a routine x ray examination of the nasal accessory sinuses was ordered, which showed a clouding of the left maxillary antrum. Antrum puncture and washings gave negative results. Antroscopy revealed advanced polypoid changes with many polypi arising from the mucosa lining the facial and orbital surfaces of the antrum. Polypi could occasionally be seen also from the nasal surface. From such findings one could easily see the reason for the frequent colds and nasal discharge. There was no doubt that a radical antrum operation was here indicated.

CONCLUSIONS.

1. In the class of cases here presented the method described of using the nasopharyngoscope possesses marked advantages in furnishing data for diagnosis.
2. It enhances the value of the x ray findings which in themselves are never entirely reliable.
3. It furnishes data upon which to determine what cases shall be subjected to radical operation.
4. It permits continuous study of the tissue changes in the antrum.
5. From the number of cases examined by this method we find that when the x ray plate shows a clouding, it almost invariably means that there is some pathological process going on within the antrum. Whether it is due to acute congestion, atrophy with fibrous changes in the mucosa, polypoid degeneration, hypertrophied mucous membrane, a tumor or fluid, can only be determined by an antroscopic examination of the sinus involved.
6. The degree of clouding on the x ray plate is no indication of the extent of disease or involvement present, as an acute congestion of the mucosa will give a marked clouding, while in extensive polypoid degeneration it may be only slight.

Possibilities in the Reconstruction of the Human Form*

By MAX THOREK, M. D.,
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The human form, modeled after Nature's most exquisite designs, and presumably attaining its highest degree of perfection in woman, by some perverse fate is frequently lacking in proportion and symmetry, even approaching the grotesque, due to deposits of adipose tissue. Doubtless Nature intended that there should be maintained the normal proportion between adipose, muscular, connective, and other tissues originally presented, and that the fat should never exceed those limits for which it served its physiological purpose, that of conserving energy and producing the roundness of contour essential to beauty.

Until a comparatively recent date adiposity was regarded as physiological, especially at certain periods of life. That the human being should lay on deposits of fat, increasing gradually from maturity until middle life, when the process became more pronounced, was expected. That the huge rolls of fat should become pendulous, burdensome and unsightly was looked upon more or less philosophically because of its being considered a process of Nature, not to be cured but to be endured.

Howard A. Kelly wrote thus: "To be a storehouse for useless adipose tissue and to carry this handicap around openly displayed wherever one goes is one of the most distressing of life's minor ailments." Giving Kelly due credit for his thoughts on the possibilities of lipectomy independent of other surgical procedures, we would make one point of variation from his estimate of adiposity. Note that he writes of this condition as "one of life's minor ailments." We would rather call it a major ailment and believe we are justified in our assumption by the fact that the person so afflicted is not only handicapped for assuming the duties of life in any capacity, but that in certain professions which will be discussed later, grace and beauty of form are so essential to success that their absence means ultimate failure. There is also a psychic phase which the author does not presume to say is dependent upon or simply a part of the symptom complex, but which is, nevertheless, very noticeable in this disease. It is certain that with the relief of the distressing burden of adipose tissue there is improvement in mental poise and vigor as well as a more favorable outlook on life in general.

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*Read before the North Shore Branch, Chicago Medical Society, April, 1921.

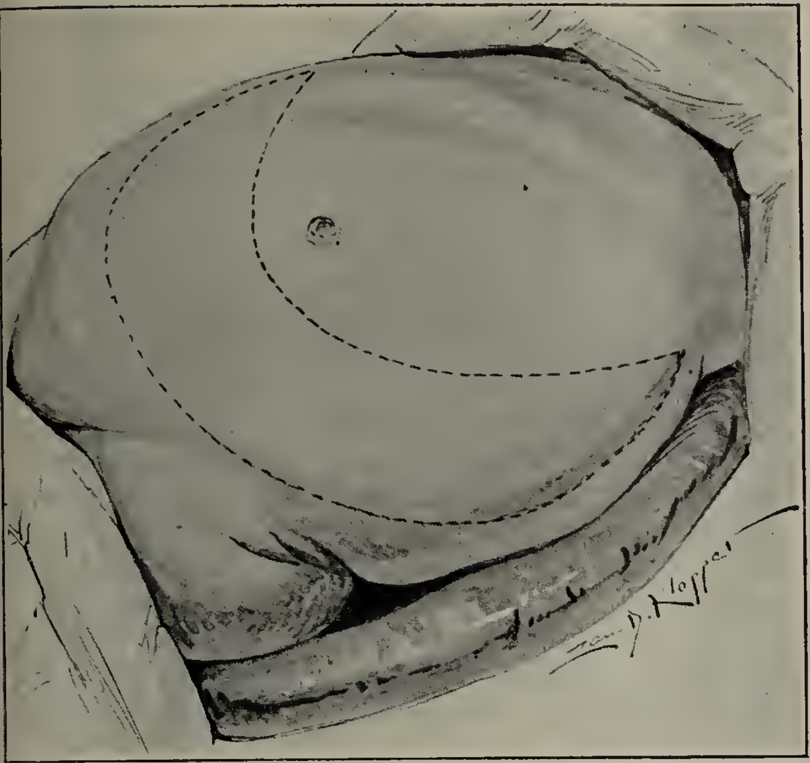
FIG. 1.—Crescentic incision used in removal of abdominal panniculus.

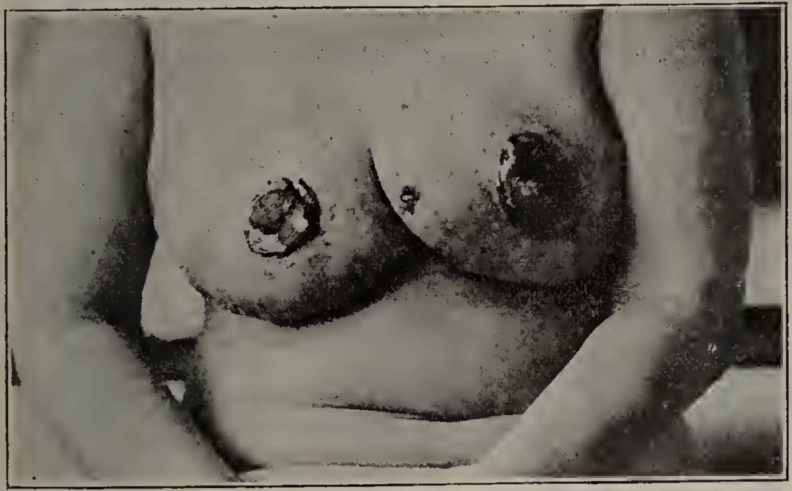
FIG. 3.—Two weeks after amputation and remodeling of the breasts. (Same case as in Fig. 2.)

In those professions where perfection of form is of almost equal importance with talent, notably dancers and singers, the accumulation of fat necessarily results in absolute failure. In one case, that of Kuttner, the patient was an opera singer who, on account of enormous breasts, was compelled to bandage them to the abdomen. This limited her breath until her voice lost in tone and volume.

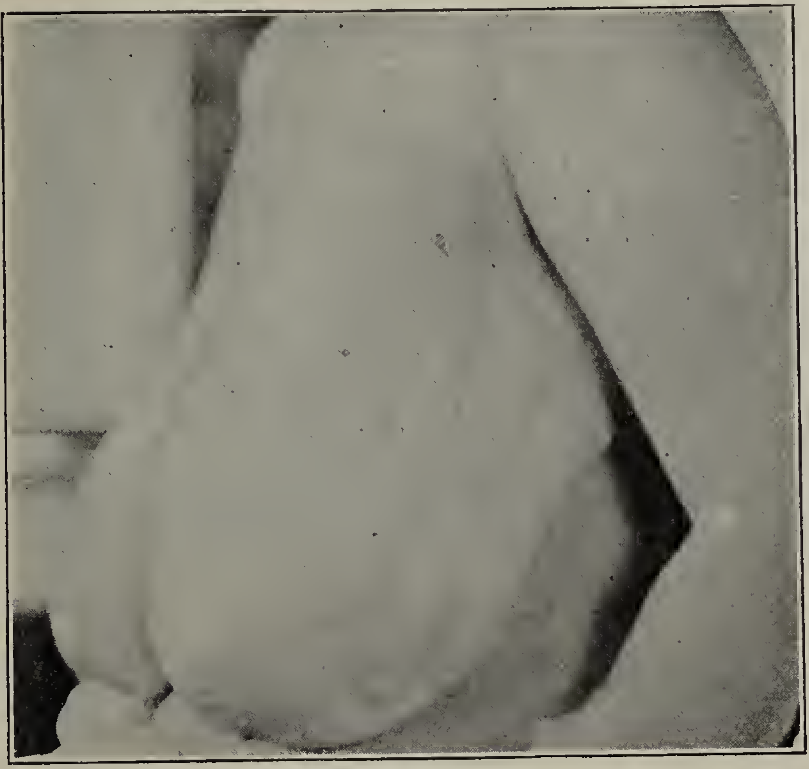
FIG. 2.—Virginal hypertrophy of the breasts.

Teachers, business and professional women, and those coming in contact with the public in whatever capacity, owe no small measure of their success to graceful proportions of physique, as well as to ease of carriage, which is impossible of attainment when there exists a marked disproportion between adipose and other tissues of the body.

Invariably with the accumulation of huge rolls of fat upon the breasts, thighs, and abdomen a waddling gait develops. Of this serious defect in her personal appearance the owner is bitterly conscious. Furthermore, the contact of and constant friction between the overhanging masses of fat with the subjacent cutaneous surfaces leads to maceration, inflammation and eczema. Dyspnea and an irritable cardiac action are frequent concomitants of this disease.

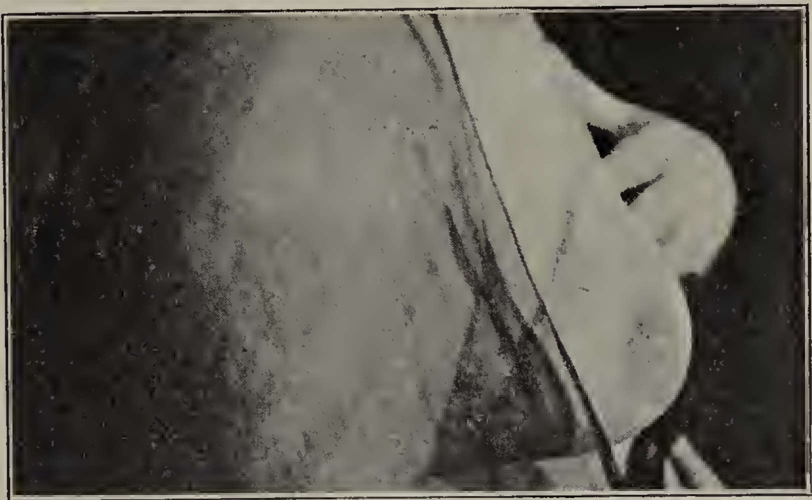
FIG. 4.—Results after operation (Case II).

A vast field for research is offered in hyperadiposity. Is it a trophic disturbance that can be reached and controlled by appropriate therapy? Or is it, and this seems probable, a syndrome dependent upon hormonic (?) or other glandular dysfunction? In many cases it is seen as a local manifestation in which the general economy does not seem to suffer. However, in many selected cases surgical relief may be offered, and the sitting by with folded arms, giving these patients no encouragement, is most distressing for patient and physician alike, to say the least.

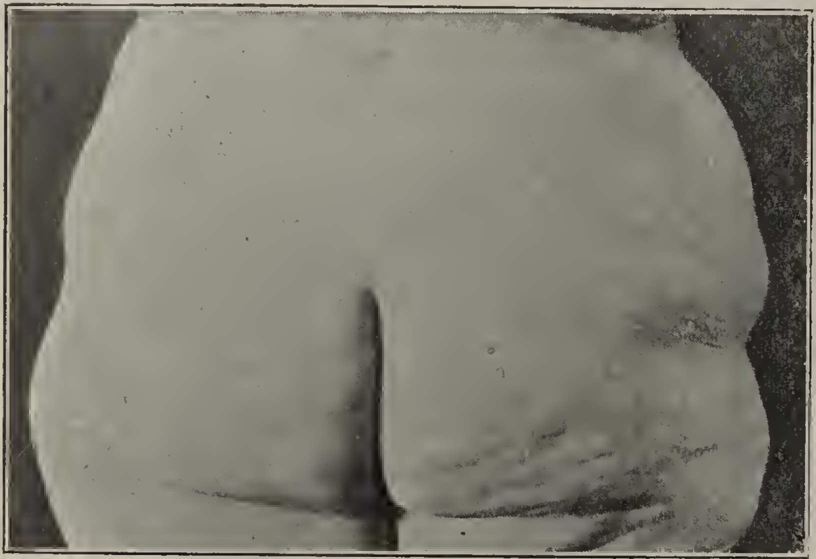

Fig. 5.—Hyperadiposity of buttocks. (Case IV).

To the surgeon who is about to undertake adipectomy for the first time I would ask him to consider well the case before him, noting the disproportion present, and forming in imagination an outline of the most perfect results possible obtainable by his efforts at reconstruction. We cannot consider adipectomy as a mere amputation of flesh. There must be maintained a consistent effort to secure beauty of contour by eliminating superfluous adipose tissue, at the same time keeping in mind the limitations that confront us. A nicety of judgment amounting almost to artistic genius is necessary in bringing together the lips of the wound to secure even adjustment, perfect coaptation, and in placing sutures with the object of leaving as little evidence of surgical intervention as possible.

The author's technic is simple but thorough. There are certain fundamental principles to which one must closely adhere if success is to be obtained in this particular branch of surgery. The minutest details must be rigidly and scrupulously carried out. This applies to preoperative care as well as operative manipulations and postoperative attention.

In the preparation of the operative field rough manipulations during the process of scrubbing are to be avoided. Gentleness during the entire procedure from the preoperative to the postoperative period is indicated. One must bear in mind that fat tissue is of low vitality and is prone to break down easily. Crushing and tearing of tissue is bad practice. Asepsis must be perfect. The incisions must be directed with the object in view of getting the best possible cosmetic result, as well as the removal of the greatest possible quantity of fat tissue. In adipectomy of the abdominal wall an incision directly over the fat mass (centre) will give one a good start. The primary cut thus made enables one to get the thickness of the abdominal panniculus well ascertained, and with the left hand directed against the fascial structures, the right hand can readily establish the amount of fat to be removed. I have evolved the crescentic incision seen in Fig. 1 which facilitates the work in no small degree.

Incisions should be practised boldly and with accuracy, in preference to jagged attempts at removal of the proposed mass. A rather large knife with a keen cutting edge is best for the purpose. A wedge-shaped mass should be removed, the apex of the wedge reaching but not baring the fascia. An incision that is placed perpendicular to the fascia, and which consequently lays bare an area of this structure, is difficult to approximate, dead space is unavoidable, and this in turn leads to the accumulation of serum and other fluids favoring infection.

Hemostasis must be exact and perfect. Oozing may often destroy the operative aim. Forcipressure, ligation with delicate catgut, of proper tensile strength, hot compresses and similar measures may all be used to attain that end. Do not close the wound before hemostasis is perfect. Sponging should be done gently with a minimum amount of trauma incident to rubbing and scraping the surfaces. It is needless to say that sufficient subcutaneous tissue and its vessels must be preserved to insure an adequate nutrition of the flaps. If large flaps are formed, particularly in cases of pendulous abdomen, reconstruction of the breasts, or plastic procedures on the back, one will get better results if he endeavors to engulf a main artery in the operative field. In closing the wound I do not use tension sutures, preferring to suture the panniculus with interrupted catgut sutures, allowing the fat surfaces to fall together in the intervening spaces. Occasionally a guttapercha or small rubber drain is introduced at each end of the wound. For the skin margins I use Pagenstecher linen, but any suture material to suit the fancy of the operator may be employed. Curved needles with cutting edges have proven the most satisfactory to myself. A long needle holder is essential, especially when working in deep wounds.

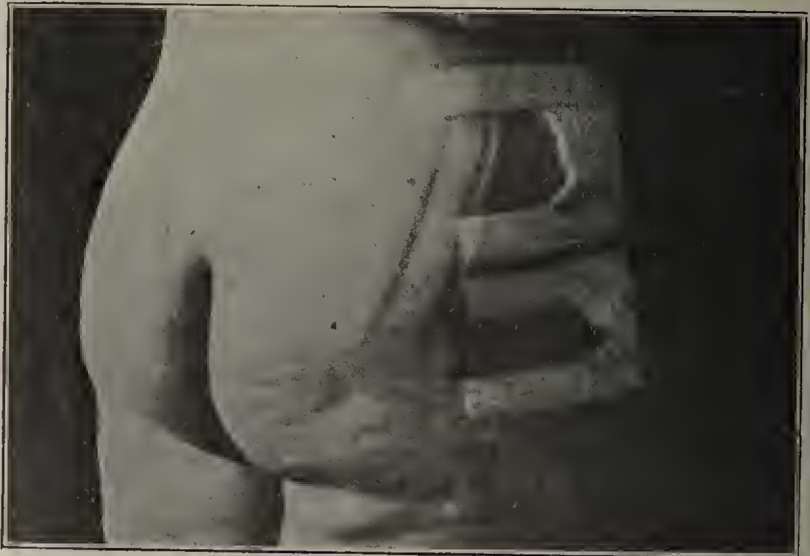

Fig. 6.—Final result of plastic reconstruction of the buttocks.

Dress the wound in the ordinary manner. Remove the drains at the end of forty-eight hours. If one has reason to believe that there may be some reaction in the tissues he may wisely permit the drains to remain another day or two.

The following are illustrative cases of what may be accomplished in reconstruction of the human form:

VIRGINAL HYPERTROPHY OF THE BREASTS.

CASE I.—Singer, aged twenty-seven, American, in whom all forms of medication to reduce hypertrophy of the breasts had failed. The enlargement had been gradual for the past three years, and was a typical case of virginal hypertrophy. All other parts of the body, except the breasts, were proportionate (Fig. 2). She was obliged to get relief to enable her to continue her avocation.

Under general anesthesia (scopolamine-morphine supplemented by ether), the breasts were amputated, leaving sufficient tissue for remodelling. The breasts were then remodelled. The great pendulosity caused the nipples to occupy a lowermost position on the pendant breasts and were therefore removed during the ablation. The nipples were then transplanted from the ablated breasts to the newly constructed ones (Fig. 3). Patient returned to the stage, mentally and physically much improved and fully able to follow her vocation (Fig. 4). In a careful search of the available literature no record is found of the deliberate attempt to transplant the nipple. This experimental study proves that that may be accomplished for cosmetic reasons.

HYPERPLASIA OF ADIPOSE LAYER OF BOTH ARMS.

CASE III.—Nurse, aged twenty-three, Indian-American. Proportionately built except for an undue deposit of fat about the arms, preventing the proper wearing of waists without much discomfort. Plastic remodeling of arms was done, with incisions placed on the triceps aspect of arms and sufficient panniculus removed to render the arms shapely. The results were perfect.

HYPERADIPOSITY OF THE BUTTOCKS.

CASE IV.—Housewife, aged thirty, American. In this case the fat accumulation of the gluteal region did not yield to any of the methods the patient resorted to. Internal medication, mechanotherapy, etc., were of no avail. Plastic reconstruction of the buttocks by lateral excision of fat masses and an accurate approximation of wound margins were followed by splendid results (Figs. 5 and 6).

CIRCUMABDOMINAL ADIPOSITY.

CASE V.—Dancer, young woman, history of an operation at the Cook County Hospital, Chicago, for the relief of some pelvic condition (pyosalpinx?). Patient did not menstruate after the operation referred to and for the past eighteen months a gradual deposit of fat about the waist line had been noted. It had become impossible for her to get employment on the stage on account of being too fat about the body. She was depressed, morose and despondent with suicidal tendencies. Operation was decided upon. Plastic adipectomy was performed with removal of superfluous panniculus, incision taking away all fat masses from the waist line, meeting in the median line posteriorly. Healing was by primary union. The results were perfect, the patient happy, and employment was secured without difficulty.

SUMMARY.

1. Plastic adipectomy is a justifiable and in many instances an imperative operation.
2. Details and technic must be minutely carried out if success is to be obtained in this particular branch of surgery.
3. A thorough study of the case prior to operation and a clear cut or definite outline fromed of the desired result of adipectomy in the individual case is imperative.
4. Further experiment and study will place operations for the reconstruction of the human form, and will establish for these operations their undeniable place in surgery.
5. With proper technic the ablated fat masses do not recur.

AMERICAN HOSPITAL.

Report of Case II, pendulosity of the breast (virginal type), will appear in the author's reprints.

Some Points in the Diagnosis of Typhus Fever*

By BENJAMIN ROMAN, M.D.,
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Director of Laboratories, Buffalo General Hospital, Buffalo, N. Y.

Typhus fever has in recent years been so much in the foreground of research, with the late war furnishing particularly favorable material, that it may, perhaps, satisfy a general curiosity if we inquired into some of the more practical results of the investigations.

The clinical picture of typhus is so uncharacteristic that its diagnosis, excepting in epidemics, has until lately been largely a matter of empiricism. There is hardly an infectious disease with which typhus at one stage or another cannot be confounded. Typhoid fever, cerebrospinal meningitis, and measles are the most common of these. Even the rash which, as we shall see later, is an important external representative of the pathogenesis of the disease is likely to fail us. It may never show its full development, remaining a simple roseola throughout the course of the disease, or it may be petechial from the beginning; it may or may not be present on the palms and soles; and it may in rare cases, as we now definitely know, be completely absent. Some of the sporadic cases offer the greatest difficulty in diagnosis, and until recently we had no positive means of ever establishing a diagnosis whether the case in question terminated in recovery or in death.

At autopsy we are just as much at sea as at the bedside. Typhus fever has no specific gross morbid anatomy, except the rash when present, and when in its distinctive stage of development, namely, when it is petechial. But even petechia often become blurred at postmortem, and besides, petechial rashes occur in many other diseases. We need only mention an enlarged spleen, degeneration of the parenchymatous organs, and such indirect changes in the body as may occur in consequence of the disturbed function of these degenerated organs and we have exhausted the gross pathology of typhus fever. These changes, too, will vary with the stage of the disease, especially as regards the spleen which though of considerable size and of rather exceptional softness (the splenic pulp practically runs out on incision) after the first week gradually diminishes in size and increases in consistency to such an extent as to appear almost normal in cases where death occurred toward the end of the disease.

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*Read before the Medical Association of Central New York, Fifty-third Annual Meeting, September 9, 1921.

To be sure, the value of such negative results in eliminating some of the diseases which in differential diagnosis might come into consideration with typhus is not to be denied. We are, however, entirely helpless in the presence of important complicating lesions which mask the picture and make it almost impossible for us to distinguish between cause and effect.

One case of typhus which showed at postmortem as a cause of death an extensive hemorrhage of the dura mater and some intermeningeal hemorrhages, both satisfactorily accounted for by the presence of contracted kidneys, gave origin to a virus which we kept alive for three years, transmitting it from guineapig to guineapig up to the one hundred and second generation, the animals showing the typical temperature curve, the blood picture, and immunity to further typhus infection. In this case, however, a very large spleen was found as the only evidence of a possible typhus, but in a second case from which virus was obtained for animal inoculation, the animals reacting typically, the autopsy revealed all the lesions of a septicopyemia from staphylococcus infection starting from gangrene of the lower extremities in consequence of exposure to cold. In conjunction with this there was found an influenza bronchitis and bronchopneumonia. Here there was sufficient cause for the acute tumefaction of the spleen, while the concomitant typhus, the presence of which had been positively demonstrated by animal experiment, remained entirely indiscernible. And so were all our typhus autopsies complicated and difficult of interpretation.

The complicating lesions in typhus also vary widely enough and are entirely too inconstant to lend the clinical or anatomical picture any special aspect. Bronchitis, lobular pneumonia, caused by many different microorganisms, gangrene of the lung, and less frequently hemorrhagic nephritis, all occur as complications of typhus, but also, and with similar frequency, in many other infections; similarly perichondritis, and necrosis of the laryngeal cartilages. On the other hand, such sequellæ as gangrene of the toes or fingers, or of the tip of the nose, as may occur in certain epidemics, must, in the light of our present conception of the disease, be viewed as peculiar to typhus, as we shall see later.

In this respect typhus was not unlike a great many other infectious diseases, the direct cause of which is not known, and whose anatomical changes in the body are not specific. In a disease like typhoid, for instance, we establish a definite diagnosis by demonstrating the specific exciting agent in the blood, or in the dejecta; or, by demonstrating specific immune bodies in the patient's serum. Failing this, if the patient dies, we can still have a diagnosis by demonstrating the characteristic intestinal changes produced by this disease. In typhus we were entirely helpless because, until recently, in addition to our ignorance of the exciting agent, its specific anatomical changes were concealed from us.

However, at the present time, and as an important result of recent investigation in the field of typhus, we may say that one of these two impediments to positive diagnosis has practically been removed, namely through the discovery by Eugene Fraenkel of changes in the body, which are so distinctive as to give them the character of actual specificity. These changes pertain to peculiar lesions in the small arteries, or precapillaries of the skin, underneath the efflorescences of the eruption. The essential changes are seen in the vessels coursing through the pars reticularis cutis, at right angles to the surface; and they consist of, on the one hand, hyaline alteration and necrosis of the innermost layer of the vessel wall, and on the other hand cellular proliferation, predominantly in the media, leading to the formation of circumscribed nodules along the wall of the artery. These findings were confirmed by all those who have occupied themselves with this subject. By way of control, we have examined systematically a large variety of papular and petechial eruptions of the skin in different affections and nowhere could we find similar changes. In some places this discovery was utilized as a means of diagnosis in questionable cases. Out of over five hundred such examinations we have been able to diagnose typhus one hundred and fifty times. In the beginning it requires a little practice, even for the experienced histologist, to recognize these rather fine changes, but once one is familiar with them they are not likely to escape him. It must be born in mind that we are not dealing here with an ordinary socalled perivascular infiltration of the skin, which one so often meets with in routine skin examinations. but with an affection of the vessel itself, with an arteritis. It has its beginning in a necrosis of the intima and is followed by proliferative changes in the rest of the wall, probably as a reaction to the intima necrosis. Besides this, just as in all forms of vascular necrosis, the contents of the vessel in the necrosed area, the blood coagulates, forming a thrombus. The elements constituting the infiltrate are found chiefly within the arterial wall and as the process is not a diffuse one, the affected areas appear as nodular swellings along the course of the vessel. The necrotic process does not stop at the intima, but continues on to the media, eventually involving also the adventitia. The character of the infiltrating elements is not yet definitely determined. They are large uninuclear cells with considerable cytoplasm, appearing to have sprung from fixed tissue elements rather than to have migrated from the blood. Fraenkel looks upon them as young descendants from the middle coat of the artery.

Thus the anatomical substratum of the typhus eruption has been revealed. It is the stenosis of the vascular lumen by the thrombus which causes the circulatory disturbance in the skin, culminating in the escape of free blood and thus producing the petechium. Ordinarily, after a while, the circulation becomes rectified, the rash disappears; but if, as it occasionally happens, a larger vessel has been involved, the area supplied by that vessel may become the seat of gangrene, the condition not infrequently seen as a sequel to typhus.

As was to be expected, the demonstration of these changes in the skin led to further examination of other organs in typhus, with the result that similar changes have been shown to exist in the liver and the spleen, the brain, and other organs. We have seen these lesions in some of the organs of animals who died of experimental typhus, especially in the brain. Moreover, there seems to be some relationship between the clinical symptoms of typhus and these lesions; and, according to Munk and Jergens, there exists a definite parallelism both as to period and intensity of development of the brain symptoms on the one hand, and the eruption on the other. Brauer goes so far as to state that the clinical symptoms of typhus are, not as heretofore considered, of toxic origin, but mostly conditioned by these vascular changes. In other words, that typhus fever is essentially an organic disease of the small arteries.

Whether or not we agree with this, there can be no doubt of the specific nature of the lesions, and, situated as they are, particularly in the skin, we do not, in doubtful cases, have to wait for the patient to die in order to clear up the diagnosis, but can excise one of the efflorescences by means of a skin punch, a knife or a pair of scissors, taking care to include some corium in the excision, and send it into the nearest laboratory for examination. Of course, it must be sent in some fixing fluid, preferably Orth's mixture, but strong alcohol or ten per cent. formalin may also be used. A diagnosis could then be had in thirty-six to forty-eight hours.

Another point of importance in the diagnosis of typhus is the examination of the blood. Though not nearly as pathognomonic as the histological picture of the exanthem, the picture of the white cells is characteristic enough, in conjunction with other evidence, or even alone, to warrant an opinion in difficult cases. It is especially valuable in differentiating it from typhoid. Only in one point does the blood behave exactly as in typhoid, namely, in the complete disappearance of the eosinophile leucocytes. But, in contradistinction to typhoid, it shows a leucocytosis from the beginning which need not, however, be marked, but is mostly a polynucleosis, never a lymphocytosis. There are, however, exceptional features to the white cells in typhus which when taken together appear as a well marked peculiarity of that disease. First, the polynuclear leucocytes, when examined in properly made smears, show a marked degeneration consisting of a gradual diminution and breaking down of the nuclear chromatin, and vacuolization of the cytoplasm. Secondly, there is a marked increase in the large mononuclear cells of Ehrlich, which in our cases showed as high a count as fifteen per cent., and which, when very much increased, according to some observers, particularly Love in England, seem to signify a tendency to recovery. Thirdly, the appearance in the blood of the socalled irritation cells of Turck in comparatively large numbers. We have seen them as high as nine per cent. sometimes in a form approaching the true plasma cell. Finally, there is almost always a conspicuous number of basophilic leucocytes or real mast cells.

Regarding investigations on etiological lines, great progress had already been made before the war. The last few years have only served to confirm and establish definitely the facts brought out by Nicolle, Gavino and Girard, Ricketts and Wilder, Anderson and Goldberger, Sergeant, Foley and others. While it is true that the exciting agent is still unknown, we have the immense advantage of knowing the means of infection. Through the work of the last named investigators it was definitely proven by means of experiments on men as well as on animals, that transmission of typhus fever takes place through an intermediary, the clothes louse (Pediculus vestimentorum). Unequivocal proof of this was obtained especially by Nicolle and his coworkers and by Ricketts and Wilder. The value of this discovery was recognized early in the late war, and from the experience of many observers this seems to be the only mode of transmission of typhus from individual to individual, excepting of course such direct inoculations as may occur in laboratory infections or at necropsy.

Not knowing the exciting agent, it is difficult to say whether the louse plays the rôle of a real intermediate host, in whose body the germ undergoes some special developmental cycle, or it merely acts as a passive carrier of the virus from one individual to another, somewhat like the flea in its transmission of plague, or the tick in transmission of tick fever.

Of the numerous announcements that have been made before and during the war, of the discovery of the germ of typhus, none have been able to hold their footing in the face of a serious analysis of the claims. Yet the activities in that direction, if they did not yield the desired result, led in one case to the discovery of an exceedingly useful diagnostic reaction.

Weil and Felix, in culturing excreta from typhus recovered from the urine in one case, a strain of the Bacillus proteus vulgaris. In an attempt to test the etiological relationship of this strain to the disease, they carried out a number of agglutinations with typhus sera against the strain, and received positive results in every case. This has been corroborated in many places and, while I am not familiar with the results of this reaction on Mexican typhus, I have personally had occasion to test it on African and on Asiatic as well as on European typhus and I have found it to be of great diagnostic value. In my experience, after the beginning of the second week, it is almost invariably positive in dilution of one to a hundred and above. A systematic agglutination of all sera that came in for examination yielded, in a large series of cases, only twice a positive reaction in patients suffering from diseases other than typhus. They were two cases of the Y type of dysentery. I venture to say that in the future the reaction may prove as useful as the Widal reaction in typhoid. The explanation generally given for this peculiar phenomenon is that it is a form of paragglutination.

Typhus Fever*

By W. A. WOVSCHIN, M.D.,
New York.

Typhus fever, historically classed in the plague group, is epidemiologically under certain conditions one of the most infectious, specific, insect born diseases.

ETIOLOGICAL CONSIDERATIONS.

The exciting cause of typhus, in spite of many assertions, is as yet not definitely settled. The described organisms of Petroushka, Plotz, Korshun, Rabinowitz, Nedrigailow and others fail to satisfy careful critical inquiry and can not be recognized as the specific cause of the disease. Several bacilli, a peculiar spirochete, flagellates, cocci and other obscure bodies found in the blood and urine of typhus patients have been cited by various investigators as the specific cause. And as is almost always the rule in medicine, where there is much controversy, there is a lack of simplicity, truth and definiteness.

I do not intend to discuss and analyze the numerous investigations and literature on the subject. The interest, however, is compelling and I shall, therefore, attempt only to examine and summarize as briefly as is conducive to an intelligent appreciation of the most valid up to date researches in that field.

For purposes of simplicity the results of the studies of the specific cause of typhus may be reduced to a few groupings.

To the first group belong the work of Plotz, Baer, Olitzky, M. Popoff, Panev, and others. According to these investigators the bacillus to which H. Plotz lays claim is the exciting organism of typhus. The bacillus which is described as a tiny anaerobe, nonmotile having polar granules, does not form spores and is gram positive. It gives specific agglutination with one to fifty dilutions of serum of convalescing patients from typhus. They have also obtained pure cultures of the isolated organism, inoculated guineapigs with the organism and succeeded in transmitting the disease to the animal. The organism was subsequently recovered from the animal. They have obtained all the immunological reactions on the serum of the animal, such as agglutination, complement fixation, precipitins and opsonins, similar to the reactions exhibited in the studies on the serum of human typhus patients. Thus all Koch's postulates to prove specificity of an organism as a causative factor of a disease, have apparently been satisfied. But the theory of relativity, which questions the immutability of laws in another field of science, displays an element of dubiousness in laboratory assertions. The specificity of Plotz's bacillus becomes doubtful, when we consider that similar claims and virtues for organisms isolated from blood and urine of typhus patients by Rabinowitz, Horiuchi, Klodnitzki, Korshun, Felix and Weil proteus X 19 and Kreucher's Bacillus pyocyaneous and, remembering, that in the study of the etiology of other obscure infectious diseases, such as scarlet fever, yellow fever, swine plague and others, isolated nonspecific microorganisms frequently gave classical immunity reactions, which led to confusion of the cause of the disease, and later have been shown to exhibit their reactions by virtue of carrying the specific virus mechanically, so to say, on "their backs."

It is, therefore, obvious that Plotz's bacillus can not definitely be accepted as the exciting microbic agent of typhus.

The second group is represented by Ricketts, Wilder and Provak. They have found bipolar cocci bodies in lice, which were named later by Rocha-Lima *rickettsia*. According to Rocha-Lima, who exhaustively studied the subject, these *rickettsia* in the lice after having sucked the blood of a typhus patient during the acute illness, penetrate into the epithelial cells of the intestinal tract of the louse, develop, change their morphology and multiply there. When an emulsion of lice with the presence of infected *rickettsia* is injected into a guineapig, it causes typhus in the animal, while an injection of an emulsion of noninfected *rickettsia* lice does not reproduce the disease. So that an examination of a louse and finding *rickettsia* in the epithelial cells of the intestinal tract, is a reasonable diagnostic sign that that louse has sucked the blood of a typhus patient. And Rocha-Lima sums up his conclusions as follows:

1. That a single sucking of the blood of a typhus patient during the height of the disease by a louse will after a few days elicit the presence of *rickettsia* and render the louse infectious.

2. That the *rickettsia* in the louse, after having become infected with typhus blood, requires from four to eight days to acquire the ability to infect.

3. That during the fall of the temperature of the patient and thereafter during convalescence after repeated attempts, the blood fails to stimulate the development of intraepithelial *rickettsia* and does not, therefore, render the louse infectious. Which speaks for the likelihood of the absence of human carriers.

4. That lice already infected with typhus can be fed for a long time on the blood of convalescing patients, and still retain their ability to infect. That speaks for the transmission of typhus by lice of convalescent or fully recovered patients.

5. That the virus of typhus can be demonstrated in infected lice either by finding the microscopical *rickettsia* in the epithelium of the intestinal tract or by inoculating in guineapigs an emulsion of infected lice, resulting in producing the disease in the animal.

6. That the content of infectious material of a single louse is sufficient to cause the disease in an animal. That speaks for the high toxicity and potency of the typhus virus.

It may be said here that Topfer and Schlusler have independently corroborated the findings of Rocha-Lima.

Not only is the bite of an infected louse infectious but also the excreta of the insect. This is deduced from a laboratory incident. Mueller and Urizio in their laboratory were trying to inoculate a guineapig with an emulsion of infected lice stools. The syringe filled with the emulsion was being held by Urizio while Mueller was holding the guineapig ready for injection. The animal jerked and spilled the emulsion over the hands of both. Urizio was immune, having had typhus two years before, but in Mueller, whose hands were irritated from another cause, there developed seventeen days after a classic form of typhus. No other possibility of contagion was known at the time.

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*A summing up of critical observations and inquiries during my stay in Soviet Russia, commissioned by the Joint Distribution Committee to make a medicosanitary survey.

The *rickettsia* are described as minute cocci-bodies, from 0.3 to 0.5 microns long, gram negative, with Romanovsky-Giemsa stains appear intensively red on a light blue background of the protoplasm of the epithelial cell. The bacillus of Plotz on the other hand, is much bigger, coarser, irregular in form and is gram positive. Thus it is evident that the *rickettsia* deserve a place in the consideration of the etiology of typhus.

But, of course, owing to the inability as yet of isolating pure cultures of *rickettsia* and that in inoculation of guineapigs we are compelled to use an emulsion of the whole body of the louse, there creeps in the same question I mentioned above in remarking about the specificity of Dr. Plotz's bacillus, namely, the possibility of surface contamination with the typhus virus.

The third group: Nicolle believes that the cause of typhus is of a protozoan nature. He points out that in the spread of the infection, an intermediary host, the Pediculus vestimenti, is the carrier. Such is the general rule of protozoal infections. In this connection it is worthy to mention that Ficai reports finding in the brain of persons who died at the height of the fever in typhus numerous corpuscles two to three microns in diameter in and outside of the large nerve cells of the cortex and the nuclei of the base.

Experiments on guineapigs and monkeys show that after complete exanguination of the animals the virus still adheres to the various organs, such as the adrenals and brain tissue. The whole blood or defibrinated as well as the serum alone and leucocytes are infectious, whereas, erythrocytes washed from serum do not cause infection. Blood serum passed through a Chamberlain filter does not cause infection.

To the fourth group and of special scientific and particularly of great practical import belong the researches of Felix and Weil. They have isolated from the urine of typhus patients a special type of proteus, closely simulating Bacillus proteus vulgaris, but differing from the latter in its specific biological immunity reactions with blood serum of typhus patients. Felix and Weil have demonstrated that their proteus X 19 gives complete agglutination with typhus blood serum in over seventy-five per cent. of cases after the fourth day of the disease and on the sixth day it reaches almost one hundred per cent. The dilution to be positive and of diagnostic significance should be one to one hundred. Numerous repeated laboratory experiments substantiated the test and the now named Felix-Weil reaction for typhus has come to stay with us like the Widal or Wassermann reaction.

Friedberger has found that the proteus X 19 also responds to all immunity reactions and he goes so far as recognizing it to be the specific cause of typhus.

It is difficult, as is plainly evident from the brief sketch of the presented outline of the claims of various investigators, to accept without reservation one or the other as the only and true specific agent causing typhus. But the fact that it is possible to store in the laboratory lice cultures of typhus and also infect animals experimentally, opens a wide horizon for research and warrants the hope that we are on the eve of settling the mooted question of the specific etiology of typhus.

PREDISPOSING CAUSES.

Predisposing causes: depressing bodily and mental influences, overwork, anxiety, unhygienic and unsanitary conditions, squalor, poverty and overcrowding pave the way for epidemic dissemination. Of paramount importance are the hardships of war and famine visitations and other social and economic cataclysms, such as revolution, causing prostration of the population. An interesting illustration of the effect of overcrowding, hunger and anxiety as a factor in epidemic spread can be drawn from the following observation:

Professor A. H. Seisin, the Soviet Commissar of Epidemiology, related the following:

In Russia even in the peaceful time, during the Czar's régime, there were yearly reported from various parts of the country about one hundred thousand cases of typhus. The proportion of the infection among the rural population was seventy per cent., while that of the urban population amounted to thirty per cent. The reason was the better hygienic and sanitary conditions of the city dwellers as compared with the unclean habits and environment of the peasants in the villages. During the great epidemic of typhus in 1918-1920 the picture was completely reversed: the cities had an incidence of infection reaching seventy per cent., while the rural quota was reduced to thirty per cent. The queer phenomenon was easily explained.

During the climax of the revolution a massive migration took place from the village to the big cities. Millions of peasants abandoned the soil. Soon after the social revolution of the Bolsheviks there set in the complete demoralization and breakdown of transportation. The rolling stock that was miserably in use was entirely confined to military necessity: cars and trains were mobilized exclusively for transportation of troops and food to the many sided civil war and other fighting fronts. The peasants, therefore, were stranded in the cities and owing to lack of construction of new living quarters and the complete ruin of over a half of the houses of the prewar time which was even then inadequate, the congestion and overcrowding in the houses became desperate and hopeless. Virtually people slept in many rooms standing. In addition, the breakdown in the plumbing and sewer systems in the houses and streets had literally converted cities into gigantic privies. And the result was the above mentioned manifestation of the increased percentage of typhus infection in cities. The reverse was in the villages. Owing to the great depletion of the rural population and also the fact that the remaining peasant population could not for lack of transportation and, moreover, did not want to sell their food to the Bolsheviks in the cities, they were forced to eat it up themselves. The consequence was that their nutrition and roomier surroundings spelled a much stronger sanitary and physical resistance, which has reduced the prewar and prerevolutionary rural typhus percentage from seventy per cent. to thirty per cent.

Apropos of the appalling epidemic of typhus in Russia for the past few years, the mere mention of the rough official, statistical estimate will make one shudder from horror. It is estimated that there have been over twelve million typhus cases in Russia with an average mortality of ten per cent. Among the crowded places in camps and prisons the mortality raged as high as forty per cent.; among the medical profession, nurses and hospital attendants it came close to twenty-five per cent. Of the eighteen thousand doctors in Russia, from four to five thousand succumbed victims to typhus fever. I wish to pay tribute to Russian doctors, who I believe are the most heroic, fearless and most selfsacrificing in their desperate fight and handling with bare hands the most dreadful epidemics of mankind.

SEASON.

The winter and early spring are the most favorable for the epidemic spread of typhus. In the main this connection appears to be established through the influence of cold upon the vital powers of the individual. People suffer more from scantiness of food and fuel and get less ventilation in their crowded rooms as winter sets in.

AGE AND SEX.

No period of life is exempt. No immunity, apparently, is transmitted from mother to offspring. Children frequently suffered from typhus. The infection, however, was found to be milder in children than in adults.

IMMUNITY.

One attack of typhus confers immunity for life.

It is interesting to mention here that everything as well as happiness in life is relative. While in Russia I frequently heard people express delight and consider themselves happy for having had typhus fever. For one could be lousy and mingle in crowds and feel immune and insured against typhus. I might say from my personal experience that the psychological feeling of fear is quite uncomfortable and takes the joy out of life even at a play or at the opera.

CARRIER.

The parasitic insect that was chiefly found responsible for the transmission of typhus is the body louse (Pediculus vestimenti). The head louse (Pediculus capitis) may also be an offender but to an insignificant degree.

Bedbugs and fleas, apparently, do not act as carriers. A louse having sucked the blood of an infected typhus patient during the first week of the disease requires at least four days before it is capable of transmitting the infection to others.

To what extent people can become lousy, it will suffice to mention the fact that in Russia on the delousing plants in railway stations, not infrequently was it found that from a single individual a half tumblerful of vermin was collected. Peacock examined the men of one division in the trenches in France and found ninety-five per cent. of the men infested with lice. Lice hatch in about ten to fifteen days and beget about five thousand offspring in the course of two months.

ALLERGIA.

Lipschutz has experimented with a skin reaction. He calls it the hemorrhagic skin reaction. He found that after the rash appears, scarification of the skin of the arm with a specially prepared antigen will, in twenty-four hours, cause a hemorrhagic reaction at the point of scarification. Other diseases do not give the reaction. Jacobstahl has used an antigen of lice extracts for the same purpose and the results are not gratifying.

Of special interest is the special typhus skin reaction conducted by Friedberger and Von der Reiss. They used an emulsion of the proteus X 19, the same with which the agglutination test is performed in the Felix-Weil reaction. In many cases when tested it induces an inflammatory reaction when injected subcutaneously in the healthy and in diseases other than typhus, but there is no reaction in typhus patients.

CLINICAL PICTURE.

Incubation period.—Professor Bajenow, having been able to watch the course of typhus from its inception in three of his medical assistants, states that in each of the three cases it could be traced to eleven days. It is quite probable, however, that the incubation period is not constant but varies from a week to three weeks, depending upon the virulence of the virus and the resistance of the patient.

Invasion.—It is generally of an abrupt onset. For a day or two, and in absence of information respecting exposure, there is nothing to distinguish the outset of typhus from that of any other fever, unless it be the absence of positive symptoms of other specific illness. Headache more or less severe; pain in the loin and limbs, succession of chills, loss of appetite, a down and out feeling is the general rule. The patient early becomes prostrated; he lies on his back with a most weary and dull expression of the face. The conjunctiva are injected, the eyes look heavy and avoid the light. The mouth is clenched, the tongue dry and difficult to protrude. Thirst is prominent. A slight bronchial catarrhal cough is a frequent accompaniment. The temperature on the first day may rise to 104° F. The pulse is accelerated and corresponds to the temperature. The spleen is enlarged. On the third day the rash appears in the form of a roseola on the trunk and extremities, which in a day or two is changed into a petechial eruption. The temperature reaches its highest at the appearance of the rash and remains high with but slight morning remissions for the rest of the illness. After the third day, sometimes later, appear the most annoying manifestations of the disease, namely, the nervous symptoms. Periods of excitation are changed into a stuporous and sometimes even comatose state. On the ninth to tenth day there may occur complications: cardiac arrhythmias and enlargement of the heart; affecting the lung, bronchopneumonia is the most serious complication; occasionally heavy albuminuria and hemorrhages from the kidneys. The first half of the second week is the most dangerous period of the disease. In many complicated cases the disease terminates as abruptly as it began. The temperature in twelve to twenty-four hours drops to normal by crisis, the pulse becomes slower, consciousness returns, the strength is rapidly regained and the patient three to four days after the fall of the temperature is ready to get out of bed. The average length of time of the illness in the absence of complications is two weeks. The minimum is one week; maximum three weeks. Relapses and iterations as in typhoid fever have never been observed in typhus.

SYMPTOMATOLOGY ANALYZED.

Temperature.—The typical temperature curve is a sudden rise in temperature to 104° F. on the first day, increasing daily till it reaches its maximum on the third to fourth day with the appearance of the rash. It may reach to 105° to 106°. With slight daily remissions the temperature is continuous for a week to ten days thereafter. By the middle of the second week there often occurs a second sudden rise in temperature, socalled perturbatio critica, or the reverse, a sudden fall—pseudocrisis. Between the twelfth and the fourteenth day there is a remission, in both mild and severe cases; even in cases about to prove fatal. In the noncomplicated cases defervescence generally occurs, some time between the thirteenth and seventeenth day. The return to normal temperature takes place by crisis. In the majority of cases it is completed in from twelve to twenty-four hours. It begins very frequently in the night, and the abrupt manner in which the fever leaves is one of the peculiar features of the disease.

Skin.—The eruption on the skin appears on the third to fifth day, rarely on the second and very rarely on the eighth to ninth day after the abrupt onset of the fever. In the beginning the rash appears in the form of a faint subcuticular mottling with a crop of rose spots, irregular in contour, about one third of a centimetre in diameter. The spots at first disappear on pressure with the finger. In about two days the subcuticular mottling and rose spots change to petechial spots, of a dirty brownish color or copper red color with the greatest pigmentation in the centre. The size of the spots becomes larger, the contours disappear, merging in the dusky brownish background of the surrounding skin. Sometimes there occur skin hemorrhages of great size, resembling ecchymosis, especially in the folds of the axilla and groin. In severe cases the entire skin may look like a massive cutaneous hemorrhage.

The eruption at first is evenly distributed on the trunk, then on the extremities; the back of the wrists, the borders of the axillæ, and the epigastrium the favorite seat. In some cases it can be seen on the palms of the hands and soles of the feet. On the face and neck the eruption is exceedingly rare. The progress of the eruption lasts about two days. It is of a single crop and from the time of the appearance of the subcuticular roseolar spots to the time of complete disappearance of the transformed petechial spots it takes eight to nine days.

In rare cases the spots persist and disappear a few days after the temperature falls to normal. The scaling is of a furfuraceous nature and may come on three to four weeks after recovery. The extent of the rash does not express the severity of the disease, with the exception of the rare hemorrhagic forms of typhus, with diffuse skin hemorrhages which as a rule are rapidly fatal. It must be remembered that occasionally during an epidemic one sees typhus without the presence of the skin rash—socalled typhus *exanthematicus sine exanthematœ,* which do not necessarily spell a light course.

Of the other skin lesions one encounters occasionally jaundice which is always a fatal sign. Also grave is the occurrence of gangrenous changes of the skin of the nose, fingers, hands, feet, ears and likewise bed sores, indicating atrophic changes.

Cardiovascular.—The pulse in typhus is always accelerated and as a rule proportionate to the temperature. The character of the pulse is full, bounding and strong. Dicrotism is rare. A fall in frequency of the pulse indicates in the majority of cases the commencement of convalescence, while a disproportionate rise in frequency signifies the accession of some local complication. For weeks, even months, after recovery from typhus, the pulse is sensitive in a good many of the cases. The slightest exertion speeds up its rate.

The heart sounds at first are normal, later become weak and distant. Especially, the second aortic sound is muffled. The capillary system is materially affected, the conjuctiva is injected, there is congestion of the internal organs and congestion and extravasation of blood in the vessels of the skin.

The blood picture, according to Weissenbach, shows on the average a leucocyte count of about 15.000 with moderate neutrophil polyneucleosis, and with the disappearance of the eosinophile and basophile cells. In fatal cases a hyperleucocytosis of 30.000 with ninety-five per cent. polymorphonuclear cells is often found.

Respiratory symptoms.—Bronchial catarrh is a frequent accompaniment. Owing to dryness in the mouth and throat, the cough is often very distressing. Increased duskiness of the face, cyanosis, a livid tinge to the rash appearing in the early part of the second week, should put one on guard for a possible pneumonic process, for quickened breathing and flapping nostrils are less noticed through the great prominence of the nervous symptoms.

Digestive symptoms.—The mouth is clenched and the lips covered with sordes. The tongue is coated with a thick white fur and is dry and heavy and difficult to protrude. Some consider the inability to protrude the tongue almost pathognomonic of typhus. The mucous membrane of the mouth and throat is dry and covered with tenacious masses of mucous. Thirst is the rule. Extreme anorexia is another constant manifestation. Vomiting may be considerable with the onset in some cases but soon subsides. Constipation is complained of in the majority of cases. The spleen is early enlarged. It is easier to determine the enlargement by percussion rather than by palpation. By the middle of the second week as a rule the spleen enlargement disappears and cannot be palpated nor percussed out. Intestinal hemorrhages are exceedingly rare, except, perhaps, in hemorrhagic cases. The liver is congested but not palpably enlarged. Jaundice sometimes occurs and is of bad prognostic significance.

Genitourinary tract.—As in most infectious fevers the urine shows traces of albumin. Only in severe cases one may see heavy albumin and casts. In hemorrhagic cases there may be found blood in the urine. The generative organs do not seem to show any affection. The effect of typhus on pregnancy differs from epidemic influenza. If in the early months, there may occur an abortion. In advanced pregnancy there seems to be very little additional risk in tolerating the disease.

Nervous symptoms.—In comparison with most of the infectious exanthemata, the nervous manifestations of typhus are most pronounced, constant and distressing. From the start the patient complains of intense headache, dizziness, pain in the back, extremities, even the tips of the fingers. There is restless sleep, frequent terrifying nightmares. These nightmares sometimes haunt the patient even durin the waking hours. Wide open eyes with an expression of terror, delirium of a noisy character at the beginning, later changing to a low muttering in type. The restlessness and insomnia often change to stupor and in severe cases even to coma, especially of coma vigil type. Subsultus tendinum, tremulousness of the tongue and hands and fumbling at the bed clothes in severe cases are commonly observed. Paralysis, hemiplegias and meningitis are rare complications in typhus.

Of the special senses, that of sight is chiefly affected. There is the invariable accompanying conjunctivitis and moderate photophobia. Next to sight hearing is considerably affected. Even in the absence of any outward and apparent organic changes in the ears, noises in the head and deafness which sometimes persist far into convalescence are frequently complained of. In about two to three per cent. of cases one sees an involvement of the parotid gland. Still rarer is affection of the submaxillary glands.

DIAGNOSIS.

The distinctive symptoms are: sudden onset with rapid rise in temperature, severe pains in the head, back and loins, marked prostration, conjunctivitis, inability to protrude the tongue and the characteristic subcuticular rash appearing on the third to fourth day. Dietch and others point out as a diagnostic sign the accentuation of the rash on the anterior surface of the elbows when the shoulder is compressed by a tourniquet for a minute. Of the laboratory tests the following are of importance: Wiener's urine reaction, consisting of a greenish coloration of an ethereal extract of the urine treated by a few drops of a one per cent. solution of potassium permanganate and May-Grunvald's solution (Jenner's stain); the Weil-Kafka reaction demonstrating in the spinal fluid the presence of amboceptors for sheep red blood corpuscles; and of special significance is Felix-Weil reaction, showing agglutination with proteus X 19.

A differential diagnosis is to be made from typhoid fever, measles, septic endocarditis, scarlet fever, smallpox, relapsing fever, hemorrhagic purpura and meningitis.

In typhoid the invasion is more insidious; rigor and headache are less marked; epistaxis is frequent, conjunctivitis is absent. The rash appears generally in the second week and is scantier and composed solely of rose colored lenticular spots that appear in crops. Dicrotism of the pulse is frequent. The tongue is more often flat, red, dry and cracked. The spleen is appreciably enlarged. Intestinal symptoms are distinctive. Diazo and Widal reactions are present. The blood cultures as well as stools and urine may show Ebert's bacilli. The blood as a rule shows a leucopenia. In doubtful cases the duration of the disease and termination by crisis in typhus will afford a point of distinction.

In septic endocarditis after the first few days the course of the disease and blood cultures will clear up diagnosis. In relapsing fever the finding of spirochetes of Obermeier clinches the diagnosis; in measles, the appearance of the rash first on the forehead, behind the ears, then on the face and the character of the eruption, which is maculopapular in type and crescentic in shape and of larger calibre. Koplick's spots are present and the disease terminates at the end of a week. In scarlet fever the eruption begins first from the neck down and is of a punctate nature. There is a strawberry tongue and frequent angina of the throat. In small pox the rash appears first on the face and the subsequent course of the disease is easily distinguishable. In meningitis there is rigidity of the neck and spine. The lumbar puncture will give a differential diagnosis.

Typhus may be associated with typhoid, relapsing fever and cholera. It is rather significant that among hundreds of thousands of cases there have been none mixed with measles and scarlet fever in children.

PATHOLOGY.

Nicol states that typhus is to be regarded as a systemic disease of the smaller arteries and the capillaries. There is necrosis and proliferation of the endothelium, associated with perivascular infiltration of leucocytes and other cells, especially in the skin and central nervous system. Owing to the proliferation of the endothelial cells Ceelen, Davidovsky and Aschoff have found microscopic knotty thickenings along the course of the affected arterioles. They even go so far as to consider these knots as specific of typhus fever.

Davidovsky has excised forty roseolar skin spots *in vivo* and in every case was able to find the peculiar endothelial knottiness and determine the diagnosis. Poitdecker even devised a set of instruments for the excision of the spots for quick examination at the front during the war.

The pathology of the rest of the organs is generally that of any infectious fever. The adrenal gland especially shows a considerable degenerative process. This probably explains the reason for the cardiovascular asthenia, progressive and rapid muscular weakness and rapid loss of weight, which is often observed in Addison's disease.

The late Doctor Frankel, of endocrinology fame, once shocked his medical audience at the New York Academy of Medicine by declaring that syphilis was a disease of the pituitary body and diphtheria a disease of the adrenals. It was not surprising to me then to find abroad clinicians that made the same assertion for typhus as being a disease of the adrenals.

PROGNOSIS.

The rate of mortality in Russia during the last epidemic was about ten per cent. In crowded places, in prisons, camps and barracks it reached as high as forty per cent. Among doctors, nurses and hospital attendants it was twenty per cent. This coincides with Dr. Osler's experience of the mortality rate of the medical profession in the typhus epidemics in Ireland.

The prognosis, of course, depends largely upon the virulence of the epidemic, the previous nourishment and physical condition of the patient, his general resistance. Sex and occupation do not seem to influence the prognosis. The age is important. Children tolerate typhus with greater ease. After middle age the mortality increases with age.

The most dangerous symptoms from the prognostic standpoint are: constant hyperpyrexia, a very rapid and weak pulse, arrhythmias, dilatation of the heart, coma vigil, cyanosis of the fingers, nose and ears; complications such as bronchopneumonia and jaundice. The hemorrhagic forms of typhus are almost always fatal.

TREATMENT.

Prophylactic.—Epidemics of typhus have been proven once more to be an accompaniment of war. The more cruel and gigantic the war, the greater the extent of the epidemic. History hardly can show an epidemic of typhus affecting so many millions of men as that of the World War. Hence it is obvious that the prevention of war between nations is of paramount importance as a prophylactic factor. And in the light of great national prostration and destruction to life and wiping out of sanitary safeguards, at the disarmament conferences should be sitting not only obsolete diplomats, but public health officers, who would act as impartial defenders of mankind.

Next in importance is the elimination of poverty, overcrowding, vermin infestation and undernourishment; education and the cooperation of public health authorities in safeguarding the communities from direful results of an epidemic; rigid quarantine, marine, international, national and interstate, especially arteries of communication.

Strict supervision of military camps, prisons, night lodging houses and other public places of crowding. These all belong to the first line of prophylactic attack. When an epidemic is at hand, the essential thing from the public health consideration is the organization of a federal centre from which all directions are uniformly dispatched to the various local state fighting units.

As in war, adequate mobilization of forces, means and personnel with careful, well managed effective tactical fronts and a supporting press propaganda to arouse the interest and cooperation of the people, and checking fear and hysteria are the only reliable way of control and victory. Independent and haphazard attempts, no matter how well meant, as practiced in our late influenza epidemic, spell defeat and unnecessary mortality and misery.

The carrier of typhus fortunately now being known, all efforts must be directed to eradicate the insect. Public baths, delousing stations, isolation and adequate hospitalization are essential. Laboratory outfits for diagnosing suspects are also essential.

SPECIFIC TREATMENT.

Vaccination, autovaccination and serum therapy have thus far failed to render gratifying results. Charles Nicolle and L. Blaizot have used the serum of a horse immunized with an emulsion of the spleen and adrenals of guineapigs. They assert that they have obtained considerable therapeutic success. Prof. E. I. Marcinovsky has tried out their method on a number of human patients and also states that it possesses some beneficial value. Positive results are claimed by Hamdi of the Turkish army. Those of his men who were inoculated are said not to have suffered from typhus. In Libau during the German occupation there was a great increase of typhus among the medical personnel with a mortality of thirty per cent. Experiments of preventive immunization have been tried on one hundred members of the medical personnel and of these nineteen became sick with typhus but none of them died. In Petrograd, 956 men were inoculated with a single dose of defibrinated blood, according to Hamdi, 638 with two doses and 471 with three doses, and the results were that among the immunized the incident of infection was five times less that among the controls.

Rocha-Lima divided the preventive experiments of vaccination into four groups: 1, by means of the whole blood, defibrinated or citrated, of patients sick with typhus; 2, by serum of the same patients; 3, by emulsions of infected organs from animals, such as guineapigs sick of typhus, and, 4, by emulsion of typhus infected lice.

Autovaccination.—K. Zelinsky tried lumbar puncture in twenty selected cases of typhus. He drew off twenty c. c. of fluid and immediately reinjected it subcutaneously into the patients. He asserts that the therapeutic value is very gratifying. Incidentally, the Felix-Weil reaction tried on all the spinal fluids extracted was negative with the exception of one case.

Orticoni, during the typhus epidemic in Roumania, tried to inject the serum of convalescing patients soon after the fall of the temperature and inject it into the spinal canal. He states that the nervous symptoms considerably improved after following this treatment.

Rudolf Roubitschek tried injections of plain horse serum in twenty-five cases of typhus and stated that he obtained improvement in about twenty of his cases.

SYMPTOMATIC TREATMENT.

Careful bedside hygiene and nursing, adequate stimulation, plenty of whiskey, saline with adrenalin injections by proctoclysis. In severe cases saline may be administered intravenously.

Lieberman found that in the restless and prostrated patients, tapping of the spine and withdrawing twenty c. c. of fluid would frequently allay the annoying symptoms.

Colloidal therapy of gold and silver used by D. J. Boyygue in France and elsewhere, outside of giving severe and unpleasant reactions, has not shown any value in the therapy of typhus.

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Acute Mastoiditis Associated With Acute Nephritis*

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Mastoiditis associated with an acute nephritis has been so little discussed that I will submit the following three cases to emphasize the importance of albumin in the urine and the necessity of routine analysis when treating doubtful cases of suppurative otitis.

The presence of an acute nephritis must be considered in diagnosing as an indication that the patient is ready for operation. The presence of blood cells and albumin in the urine is significant of deteriorating influences in the kidney. Whenever this condition exists it is due to one of two routes of infection; either the metastatic circulatory or, better, the descending route, or secondly, the ascending route by the bladder. Preexisting foci in the body are often the insidious or precipitous etiological factor. This depends on the virulence of the infective organisms; drainage established at the source and the degree of renal stasis. The kidney transmits and eliminates bacteria very much the same as the liver, spleen and intestines and is liable to damage either through the organism or the toxic products. The starting point or the primary infection is extremely variable. Nephritic inflammations have been known to follow furuncles, felons, tonsillar and dental infections, and with the report of the following cases I would like to add the mastoid.

Case I.—Mrs. L. L., admitted to the hospital February 19, 1919, with a temperature of 103.4° F. with all the fulminating symptoms of a mastoiditis of the left side. The mastoid bone was extremely broken down with a perisinus abscess. Examination revealed a streptococcus infection. The routine hospital examination showed the urine to be heavily loaded with albumin, red and white cells and casts. The following day her face began to swell and the third day the edema was so marked, especially on the left side of the face, as to close the eye, and the temperature rose to 104° plus. In view of the history and the perisinus disease a blood stream infection was suspected. The blood culture, however, taken at this time was sterile, and the optic nerve showed no inflammatory changes. The Michel clips, which were used for the closure of the wound, were removed at this time. The release of these caused a decided improvement in the edema. The operator has noticed this tendency to edema on the same side in a number of mastoid cases when the clips have been used, and it has frequently caused many anxious moments to both the patient and the relatives. Complicated by nephritis the edematous eyelid always presents itself so that it has become my custom to remove almost all the Michel clips after the first twenty-four hours. In one week's time the urinary symptoms had gradually decreased to no blood and only a slight trace of albumin. In three weeks the kidneys were functionating normally, and the mastoid completely healed.

Case II.—L. F., aged five years, referred to me April 24, 1919, with three weeks' discharge in both ears, rectal temperature 101.2° F. The child appeared poorly nourished and of sallow complexion. Her appetite was poor, she refused food, but played during the day as usual with the rest of the children. There was no history of insomnia, no pain or tenderness over the mastoid. The right aural canal appeared slightly contracted. Examination of the urine revealed casts, numerous blood cells and a heavy precipitate of albumin. Immediate operation was advised with the report of the urinary findings. The family physician, however, advised delay because of the acute nephritis. A double simple mastoid was done, both mastoids showing some pus and necrosis, especially in the suprasinus fossa. In forty-eight hours the urine had shown a decided improvement with absence of blood cells and continued to improve to only a trace of albumen at the end of seven days. In eighteen days the specimen was perfectly normal, and in six weeks the child had shown a gain of fifteen pounds in weight.

Case III.—R. G., aged eight years, was referred to me February 28, 1922. Following measles there developed an acute suppurative otitis media of the right ear. This was incised twenty-four hours from the onset. Ten days later, when seen, the patient had absolutely no pain, slept well, and seemed to be quite normal, except that the discharge continued profuse and pulsating in character. The following day his face and feet began to swell. The urine examination showed a great number of blood cells, casts and albumin. His temperature was 99° F. X rays showed an increased cloudiness of the right mastoid, but no breaking down of the bone septi. Culture of the discharge revealed a Streptococcus hemolyticus infection. Because of the complicating nephritis an immediate operation was advised and performed. A small amount of pus was found, but especially diseased granulations in the suprasinus fossa and postsinus cells. The mastoid was extremely hemorrhagic in character. A culture was taken from the mastoid cavity at this time and the microscopical examination showed Streptococcus hemolyticus. The edematous condition of the feet improved in twenty-four hours and the facial edema cleared up entirely in five days. The urine began to show a change at this time from boiling solid to a very heavy cloud. The packing was removed on the fourth day, and because of extreme sensitiveness of the patient hydrogen peroxide was used to facilitate removal, as the gauze was still fairly dry and adherent. It might be well to say now that it is my practice to allow the dressing to remain four or five days and even six days until softened by the mastoid secretions, but because of the pyelitis the dressing was removed at this time. The following day there was considerable redness about the mastoid wound. There was much pain and a rise in temperature to 104° F. A fair sized area of dura and lateral sinus had been exposed at the time of the operation, so that a blood stream infection was to be suspected.

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*Read before the Section on Otology of the New York Academy of Medicine, May 12, 1922.

A blood culture taken was sterile, white cell count 16,000 and polymorphonuclear count sixty-one per cent. A rash appeared over the body twenty-four hours later, typical of scarlet fever. It is quite possible that the use of hydrogen peroxide disseminated the streptococcus so as to cause what Osler described as a surgical scarlatina. The temperature subsided to almost normal and the rash faded at the end of five days, but in spite of this the renal findings continued to improve to the point of a faint trace of albumin and very few red and white blood cells. There then developed an acute articular arthritis in the shoulders and legs and another rise in temperature followed, and some swelling about the neck, characteristic of a deep cervical abscess. This presented itself just below the mastoid wound. Urinary findings again became extreme and after a consultation with two eminent internists, the patient was again removed to the operating room and drainage extended to the neck beneath the sternomastoid muscle, where a collection of pus was found. The tonsils being large and suspicious, they were also quickly removed at this time. For two days the discharge from the neck wound continued profuse and the urinary findings continued bad. A Dakin tube was then inserted and a nurse instructed to instil Dakin's fluid every hour so that within twenty-four hours there was another decided improvement in the urine examination. Rapid resolution then took place and the patient left the hospital with still a trace of albumin and a few red and white cells. One month later the ear presented no evidence of suppuration either in the canal or from the wound, and the hearing was 20/20 for moderate whisper. The urine was light amber with a trace of albumin. The patient's general physical condition was good.

The first and the last cases were interesting because of the simulating symptoms of a sinus thrombosis; the first due to the stasis produced by the Michel clips and the latter because of the surgical scarlatina. All three cases were of streptococcus infection, and all three patients had a three weeks' discharge. The clinical symptoms in the first case were conclusive for operative interference. The last two were borderline type, but because of the extreme renal disease immediate operation was considered advisable.

The general practitioner frequently considers the delay of the operation more advisable, but this conception I believe is erroneous, and it is the duty of the attending aural surgeon to insist on immediate operative interference, whenever the kidney condition manifests acute symptoms.

It has been suggested that ether anesthesia is contraindicated, but in all three of these cases this form of anesthesia was used, and did not seem to exacerbate the symptoms. The last case one month following the acute exacerbation still presents some inflammatory symptoms of the kidneys, but shows a decided gradual improvement. Gathered statistics of kidney infections from other sources or foci show the time required for complete resolution is variable and ranges from two weeks to three months. I wish to emphasize the importance of more frequent urine examination in suppurative diseases of the middle ear. It is ridiculous to suppose that the mastoiditis follows from kidney infection but as it is quite obvious from the report of these three cases it is secondary to that of the mastoid.

11 East Forty-eighth Street.

A Rapid Method of Blood Analysis

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Up to the present the general practitioner has not been able to carry out exact examinations of the blood. Leading physiologists have developed precise and elegant methods, which, however, can only be carried out in wellequipped laboratories and by physicians who have had special chemical training. Not until laboratory workers commenced to study the needs of the unassisted practitioner, did they simplify the practical application of their scientific methods. Today every physician can undertake these investigations.

Before 1914 the practical American had been obliged through the ever increasing cost of labor and material to carry out personally, as far as possible, all diagnostic tests. However, the quantitative chemical analysis of the blood as well as serological tests have as a rule been beyond his scope. Only recently have such methods been evolved which satisfy the requirements of the practitioner. The stipulations imply: speedy, yet exact methods; moderate demands as to special knowledge and experience; minimum requirements of apparatus and reagents; restriction of the amount of blood needed to but a few drops.

In the following only the more important methods of rapid analysis shall be described.

QUANTITATIVE DETERMINATION OF BLOOD SUGAR.

It is generally realized at the present time how important the exact determination of the blood sugar must be considered for the therapy as well as the diagnosis and prognosis of diabetes mellitus. The advantages of this method over estimations of the sugar content of urine is also clearly recognized. This applies particularly to ambulatory cases, for in such patients the amount of sugar in the urine is subject to many accidental influences. For this reason a single urinalysis can never afford a clear picture of the intensity of the metabolic disturbance; this is especially the case in those instances where the physician has no definite control over diet, occupation, and emotional impressions of the patient, and where the total amount of urine passed is not exactly ascertainable.

On the other hand, much better information as to the exact condition of the metabolic disturbance is obtained by estimating the blood sugar content during fasting, and, if desired, again one hour after administration of a definite amount of carbohydrates. By such measures one always finds the same values in the same patient under the same conditions.

The nature of blood sugar has been known since about the year 1776, when Cullen and Dobson wrote on this subject. In 1846 and 1847 the problem engaged the attention of Frerichs, Magendie, and others. The first quantitative methods for the determination of blood sugar were described by Einhorn, who employed a fermentation saccharometer, and, later, by Mitscherlich, who utilized polarizing apparatus. However, methods possessing practical value were not evolved until the year 1892. It is obvious that even these procedures are not adapted to the requirements of the practitioner or analytical chemist, for too large an amount of blood is needed, and the apparatus and special experience necessitated are, as a rule, beyond the scope of the general practitioner.

Only within recent times methods have been worked out which are available for all practical purposes. Investigations clearly showed processes based on polarization had to be abandoned, for the amount of sugar present in the blood is too small for this method of determination.

We therefore find ourselves restricted to methods utilizing the reducing properties of sugars. The drawback with the use of Fehling's and Bang's solutions is the impossibility to recognize with precision the end of the reaction in cases where very small quantities of blood are employed. However, if ammonia is added to "solution 2," a reagent is obtained which has a deep blue color, even in considerable dilution. Thus, it serves as an excellent indicator at the same time. These remarks demonstrate the advantages of Pavy's solution.

As far back as 1916 I have been able to show by means of numerous experiments that the employment of Pavy's solution renders it possible to determine with ease and precision the sugar content of even 0.1 c. c. of blood.

In a recent number of the *Schweizer medizinische Wochenschrift,* Reist has recorded experiments with Pavy's solution. He also described a method, which can be carried out also by the general practitioner in an extraordinarily simple and rapid manner. I have constructed, for the execution of this method of titration, a small apparatus, which considerably simplifies the process and makes it accessible to every practitioner and analyst.

The process is carried out in the following manner: By means of a precise capillary pipette 0.1 c. c. of blood is placed into a small test tube, which had been filled previously with a few c. c. of absolute alcohol. The pipette is then washed with a few changes of alcohol in order to remove all traces of blood into the test tube. The mixture containing the blood is allowed to stand for half an hour. Throughout this period it is shaken frequently, and at the end it is filtered through a small filter into the container of the apparatus. The residue is then washed by numerous changes of alcohol. Subsequently the alcohol is evaporated in a water bath or over a small flame on an asbestos wire net. Then 0.3 c. c. of Pavy's solution 1 and an equal amount of solution 2 as well as 1.8 c. c. of distilled water, are added. The container is sealed by a cork, which is perforated by a vertical glass tube and by the burette containing the urine. The glass is then gently brought to the boiling point over a moderate flame on an asbestos wire net. According to the suggestion of Reist, this is achieved most conveniently by allowing the glass to touch lightly the asbestos net. For this purpose Reist recommends the use of a test tube; however, I find a small glass container more suitable for gentle boiling. In addition my small apparatus has the advantageous features of allowing the boiling to occur, while the container is corked tightly and the volume of the fluid remains practically unaltered.

As soon as the liquid commences to boil, the glass stopper is pulled out and the burette inserted through the stopper in its place. Previously a one to a hundred N. solution of grape sugar has been placed into the burette up to the uppermost mark. The tap of the burette is then opened and drops of the one to a hundred N. grape sugar solution are run into the boiling liquid in the container. After the addition of every drop the container is well shaken and the end of the reaction awaited. The final completion of the discoloration is best observed over the white background of the sleeve or of paper. When this stage has been reached, the height of the grape sugar solution is read.

Three tenths c. c. of Pavy's solution require 0.0003 gms. of grape sugar for discoloration. We have, therefore, to calculate the amount of one to a hundred N. grape sugar solution consumed less 0.0003. In other words, the sum of the sugar contained in the blood serum together with the quantity of grape sugar required for the titration amount to 0.0003. Since the quantity added during titration is known, determination of the difference yields the grape sugar content of the blood. For the sake of simplicity, the amount of blood sugar contained in one hundred c. c. of serum is marked directly on the apparatus.

It is necessary with this method to have an exactly measured one to a hundred solution of grape sugar. One must, therefore,, determine its precise strength through a titration undertaken under equal conditions, but without the blood serum, before carrying out the actual investigation.

QUANTITATIVE DETERMINATION OF CALCIUM CONTENT OF BLOOD.

The quantitative determination of the calcium content of the blood may be carried out speedily and precisely according to the method of de Waard with a very small amount of blood. This is such a simple and easy procedure that one is enabled to make exact observations of the major variations of the calcium content in different diseases. We may quote as instances the diminution of the normal value of approximately twelve mg. of calcium per hundred c. c. to two mg. to the hundred c. c. in pneumonia, to four mg. to the hundred c. c. in tetany, while, on the other hand, an increase to eighteen mg. to the hundred c. c. occurs in rachitis.

Of important diagnostic value is the estimation of the blood calcium content in pupura hemorrhagica in order to determine the etiology of the hemorrhages.

The determination of the calcium content is carried out most conveniently in a small special apparatus which consists of a small graduated centrifuge glass container with a ground pipette.

The investigation is conducted in the following manner: Blood serum is placed into the container up to the mark S, and a saturated solution of ammonium oxalate is added up to the mark AO. After shaking, the mixture is allowed to stand for a quarter of an hour. Subsequently the glass is placed into a rapid centrifuge for three to five minutes. The supernatant fluid above the precipitate is removed carefully. Then the precipitate is washed in three changes of distilled water by adding every time about two c. c. of water, mixing, centrifuging, and again removing the supernatant solution. After this sulphuric acid (1:2) is added up to the mark SS and warm water (about 60° C.) poured in up to the mark O. Titration is then performed by running in drops of an exactly one to a hundred N. solution of potassium permanganate. The glass is shaken constantly and dipped into a waterbath at 60° C. from time to time. When a red color appears, which lasts for two minutes, the titration is completed. This point is best determined by holding the liquid against a white background.

DETERMINATION OF BILIRUBIN IN BLOOD.

The method recently described by Meulengracht appears to be the simplest and, at the same time, the best suited for practical use. Meulengracht employs the yellowish color of the bilirubin itself as an indicator for its presence and he determines its quantity by a simple process of dilution. This method is all the more feasible since other yellow colored bodies, as lutein, do not apparently occur in the blood serum. In any case such substances would not be of any significance in clinical investigations.

The blood examination for bilirubin affords the only possibility to determine the presence of any increase in the bile color content. This method is of value in all subicteric conditions, where the staining of the skin has not yet become obvious, and it is of particular importance from the point of view of differential diagnosis. Thus we are enabled to arrive at a diagnostic distinction between hemolytic anemia and anemia presenting a different etiology. For, if an anemia is due to hemolysis, it will always be possible to demonstrate an increased bilirubin content of the blood, while this condition is not encountered in anemia due to defficient blood production or due to considerable loss of blood.

Another sphere of utility exists in cases of cardiac insufficiency with albuminuria and signs of passive congestion. If a doubt arises, whether a coexisting nephritis is not the cause of the albuminuria and edema, the diagnosis may be arrived at by means of a serum examination for bile colors; for, in cases where the congestion is not a passive feature, but due to nephritis, no bilirubin would be encountered in the blood.

Furthermore, there are certain cases of cholelithiasis which offer special difficulties from the point of view of differential diagnosis. Here also the method may be applied for settling the diagnosis.

The presence of bile colors is indicated by the appearance of a bluish green hue. This depends on the oxidation of bilirubin to biliverdin, when a few drops of serum, obtained by sedimentation of venous blood, are added to an equal amount of a mixture composed of five gm. of trichloracetic acid, two c. c. official ferric chloride solution, and twenty c. c. of water. This reaction can also be utilized for clinical purposes for the determination of bile colors.

The quantitative colorimetric estimation is carried out in the following manner:

About three c. c. of blood are taken from a vein of the arm and placed into a small Wassermann tube, which had previously been filled, by means of a medicine dropper, with two to three drops of a twenty per cent. sodium citrate solution to prevent coagulation. The tube is placed into a stand, and, after the lapse of a few hours, the blood corpuscles will have settled to the bottom. The supernatant serum is then poured into the bilirubinometer up to the mark S. This vessel has the same calibre as another tube, which contains the faintly yellow standard solution. Sufficient 0.9 per cent. saline solution is then added to the serum, until it shows the same hue as the standard solution.

The reading is best taken by direct illumination against the background of a white sleeve. The concentration of the standard solution is termed 1. This approximately corresponds to the quite faintly yellow coloration of the serum from normal individuals. The figure reached in the process of dilution is the number which indicates the amount necessary for diluting the icteric serum in order to obtain the coloration of normal serum. In normal cases the dilution value oscillates between two and three, while in patients with pronounced icterus it varies from one hundred to two hundred (Meulengracht).

More striking, still, is the simplification of the serological examination of the blood in cases of suspected syphilis. Use is made of the flocculation, respectively turbidity method according to Sachs-Georgi Meinicke, which has been considerably improved recently by Dold. This flocculation reaction can almost substitute the original Wassermann reaction, and it is found to coincide with the latter in approximately ninety per cent. of cases.

The dilution of the extract is prepared in the glass cylinder, specially graduated for this purpose, and the alcoholic dilution is placed into another similarly graduated cylinder. Then the saline solution is prepared by dissolving a tablet in water. The solution is placed into the special tube with 0.2 c. c. of blood serum, following minutely the instructions given. Then the tubes are placed into a stand and put into a waterbath or blood incubator.

In sera, certainly known to be syphilitic, a definite flocculation occurs in the clear or slightly opalescent fluid. This cannot be well ascertained with the naked eye, but it may be determined sufficiently accurately, if the tube is viewed against a black glass-plate, turned by hand, and inspected through a magnifying glass at the same time. Very useful for taking this reading is the agglutinoscope of Kuhn and Weithe.

For more exact detailed information we may refer to the instructions for use, which are delivered together with apparatus and reagents.

The Pathology of Inflammations

*With Emphasis Upon Sepsis**

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The purpose of this paper is the presentation of the pathologist's point of view of the modus operandi of the fundamentals of inflammatory reactions with emphasis upon suppuration, for the consideration of the general practitioner. It is hoped that possibly a clearer understanding may help somewhat in the method of procedure selected for treatment.

PATHOLOGY OF INFLAMMATION.

Pathology represents a battle between the host and an invader which is constantly being carried out with more or less success on the part of the host at all times and much more frequently than is generally supposed. The character of the invader is a fixed constant basically; that is, the streptococcus, the pneumococcus, the tubercle bacillus and the treponema pallidum have definite eugenics which have been maintained since their inception. The degrees, more or less, of these characters may change within wide limits influenced by surroundings. For example, during epidemics the virulence of the streptococcus may be such that all barriers interposed by the host are trampled unmercifully. At other times the virulence of the streptococcus is much lowered and the same barriers of the host are ample against the same streptococcus eugenically identical but modified in virulence. On the other hand the barriers of the host while they, too, are basically fixed, are subject to greater variations due in a large part to what is vaguely termed health and resistance or the opposite, disease states and lowered resistance. In addition, specific resistance against a particular invader adds an important rôle.

With this preamble, in a study of this sort it is important to bear in mind that the principles of an invasion will be pathologically exactly the same, regardless of the site of the reaction. They may be considerably influenced by the site selected but their pathology and their rational treatment should be identical. It may be argued that a streptococcic meningitis will differ from an acute exudative appendicitis, due to the streptococcus, but the only real difference is that one produces opisthotonos and Koenig's sign, while the other produces pain and boardlike rigidity in the abdomen. Both are due to the streptococcus, both will present fever and leucocytosis and microscopically have the same cellular changes. Both will result in death unless properly controlled by treatment locally. On the one hand it is fortunate that the appendix can be removed while on the other the meninges cannot. As a result in cases of appendices the patients will all recover while the meningitics will probably all die.

DEFINITION OF INFLAMMATION.

What then is the definition of an inflammation? An inflammation is a disease in which there is an acute, a chronic or a specific reaction against a stimulus, frequently bacterial, responsible for cell and group unit changes in the body, with an altered physiology and subjective symptoms modified by the site of the invasion.

An invasion is the movement of the stimulus through a portal of entry with or without a reaction or a focus of infection at the portal of entry. With a reaction at the portal of entry a focus of infection may be initiated from which further disease at distant sites may be set up at a later date. Without a reaction at the portal of entry the disease may be initiated at a distant point immediately.

The reactions set up depend upon the character of the stimulus or injury responsible for them. This is more a modification or an intensity of the integral portion of an inflammatory reaction concerned than any new formations. The body is made up normally of groups of cells. There is no disease which produces a foreign or new type of cell but diseases produce a new grouping of cells and of function. This is responsible for the alterations of the normal. Even in cancer there are no new cells; there are new groupings and modifications which when the truth is finally known, will no doubt turn out to be specific reactions to an invader probably bacterial in character.

TABLE I.

General Classification of Inflammations

1. Acute
    - A. Catarrhal
    - B. Parenchymatous
    - C. Interstitial
    - D. Exudative
    - E. Suppurative
        1. Abscess (localized)
        2. Phlegmonous (diffuse)
        - e.g.
            1. Endometritis (Puerperal sepsis)
            2. Appendicitis
            3. Cellulitis (Felons; abscesses)
            4. Bronchitis (Nonpneumococcic)
            5. Tonsillitis (Quinsy)
            6. Meningitis (a. Streptococcic) b. Epidemico-meningococcic)
    - F. Ulcerative
    - G. Necrotic
    - H. Gangrenous
2. Chronic
    - A. Catarrhal
    - B. Parenchymatous
    - C. Interstitial
    - D. Suppurative
    - E. Ulcerative
    - F. Necrotic
3. Specific
    - A. Tuberculosis
    - B. Syphilis
    - C. Leprosy
    - D. Actinomycosis

For purposes of study inflammations may be grouped as in Table I. This is an arbitrary arrangement and simplifies the diseases of different parts of the body; as an example, we may have an acute catarrhal endometritis, gastritis, cystitis or a chronic suppurative osteomyelitis, otitis media, tonsillitis, and other conditions.

Since this paper deals with emphasis upon sepsis, let us take up the details of an acute suppurative inflammation. There will be only the differences as just outlined whether our suppuration involves an endometrium, an appendix, the meninges, the tonsils, the bronchi or cellular tissue.

In the first place an invasion with a pus producing stimulus is necessary. This is a fixed constant. It may invade directly or it may be secondary from a portal of entry or a focus of infection. It alone may be responsible or secondarily it may set up a reaction after an injury from some other cause. The pus producers found in disease are the micro-organisms and the streptococcus, staphylococcus, micrococcus catarrhalis, pneumococcus, Bacillus coli, Bacillus dysenteriæ, the spirillum of Vincent, and the specific gonococcus and meningicoccus being the most important.

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*From the Department of Laboratories and Research Medicine, The Geisinger Memorial Hospital, Danville, Pa. Read before the Mt. Carmel Medical Society, Mt. Carmel, Pa., March 14, 1922.

VASCULAR REACTION IN SEPSIS.

After the invasion there is found the classical, clinical group, rubor, dolor, calor, and tumor. What are these pathologically? The first reactions are blood vascular in character due to the bacterial toxins. The bloodvessel walls dilate, there is a separation of the endothelial cells of the capillaries with the escape of fluid. As the walls dilate the current of blood slows down, the red blood cells become sticky and stasis of the current occurs. This may go on to actual thrombosis and complete obstruction in the capillaries involved. With this the leucocytes marginate to the walls of the vessels and by their ameboid movement emigrate through the wall and toward the point of irritation. There is a varied degree of diapedesis of the red blood cells. The amount of this reaction depends upon the amount and character of the toxin of the exciting stimulus. In an infection through a hair follicle on the back of the hand, the area involved is relatively small and the number of vessels few; while a puerperal endometrium invaded, the area is larger, the reaction is greater, the entire uterus becomes boggy and the symptoms are early more grave.

The edema is produced for several factors; first, the blood plasma carries possible immune bodies as antitoxins, agglutinins, bacteriolysins, opsonins, fresh oxygen from the red blood cells and accumulation of carbon dioxide. The influence of the plasma titration of the edema, brought about by the bacteria and the cellular portions of the reaction, is important as well as the maintenance of the chloride balance in the cells and the osmotic permeability for chemical interchange. When the area of suppuration is large it may so influence the general plasma that acidosis results.

LEUCOCYTES.

The leucocytes, especially the polymorphonuclears, are the scavengers, the scouts, the machine guns. They combat the invader hand to hand and by their power of phagocytosis and bacteriolysis aided by the opsonins, break down their own integrity resulting in the pus cell. This is a dead or dying leucocyte following the battle.

The leucocytes emigrate to the point of intensity of the stimulus influenced by chemotaxis, either positive or negative, and produce a part of the zone of reaction or line of demarkation. Here the walling off of an abscess or an appendix results. When this walling off is incomplete and the toxicity of the invader is greater than the immunizing power of the reacting host, the suppuration becomes diffuse with the production of a phlegmon. In this battle more or less destruction by necrosis results to the part involved. This is often hastened by secondary invaders, especially of the colon group when necrosis and gangrene are added to the suppurative process.

The migration of the leucocytes acting as phagocytes beyond the zone of reaction results in some spreading of the disease and this seems to be one of the few weak points in the otherwise perfect protective mechanism. This possibility is not as grave since the leucocytes, becoming pus cells, die and in this condition their further migration is stopped. They do get into lymph streams with further inflammatory reaction and the typical lymphangitis or red lines but their migration is effectively stopped at the first chain of lymph nodes even when suppuration occurs in them as in inguinal buboes. When they get beyond their secondary lines or if they enter the blood stream, a bacteriæmia occurs and metastatic abscesses are likely at distant points when a condition of pyemia will maintain. These abscesses are always multiple and end fatally as a rule.

A pus cell, then, is a dead or dying polymorphonuclear leucocyte acting as a phagocyte. While pus or purulent material is made up of pus cells, bacteria responsible, necrotic detritus of the part involved, red blood cells, products of fibrinous exudate, fluid and chemical alterations.

What of the repair of a suppuration? The reparative reaction or healing by granulation is a replacement process and cannot be fulfilled until every particle of the suppurative process has been completed. All portions of tissue destroyed or necrosed must be disposed of, either by a slow process of Nature, phagocytosis and absorption or aided by mechanical means. It is the careful application of this principle utilized by the French during the World War and known as debridement that will shorten and hasten an otherwise indeterminate repair and recovery.

Granulation tissue consists in the formation of new bloodvessel loops arising from proliferation of the endothelial lining cells of uninjured vessel walls backed up by fibroblasts. The latter are derived from the fixed connective tissue nuclei, lymphocytes and plasma cells and following their cellular stage elongate into fibrils of connective tissue which eventually become dense, hyalinized and contracted, with the formation of a scar. A replacement of other structures occurs to a limited extent. New epiderm will form eventually over an ulceration, new muscle fibres may quite adequately bridge over or through an abscess, new endometrium may be replaced, new glandular structure may be modified while new nerve fibres are the last to return and probably never do to any considerable extent.

CONCLUSION.

In conclusion, it would be well to emphasize the well known dictum, wherever pus occurs, early incision and drainage is indicated. Great care should be exercised not to go beyond Nature's lines of defense and spread what would otherwise be well localized. In addition, the common practice of squeezing and pressing on an abscess area is almost criminal. It is not only painful, entirely unnecessary, not only does no good but does the greatest harm in upsetting the orderly lines of demarkation. After thorough drainage, efforts at sterilization are to be inaugurated and the use of properly prepared Dakin's solution or dichloramine-T are the best remedies offered to date. After sterilization the practice of debridement followed by efforts at closure and granulation by primary union offers the best course for early and complete recoveries.

Editorial Articles

EFFICIENCY OF THE HUMAN MACHINE.

The term efficiency, used so glibly a few years back, has fortunately fallen into disrepute save as it stands for machinelike productivity. Some interesting work has been done of late on the human being from this mechanical point of view, and with some rather unexpected results. If we may trust the observations of Vernon, heavy work, such as that carried on in rolling mills, is in no way injurious from the mere strenuousness when done by men of good physique working a reasonable number of hours.

Cathcart, in a recent number of the *Lancet,* sums up our knowledge of conditions for maximum output. "If," he remarks, "we were concerned only with the capacity of a certain group of muscles to perform a given amount of work, the solution of the problem would be relatively simple. But we are dealing with a living organism capable of repairing worn out parts, as and when required, and varying not only in capacity to perform work, but in will to work. . . . It can and does perform hard muscular work with vigor and joy; yet, if the employment and environment be distasteful, it can be reduced to impotence by work capable of being done by a child. Yet, in spite of the many stresses and strains of life, unless overloading is excessive or too long continued, the organism, so long as it remains physiological, is practically unaffected by ordinary hard work."

The limit of efficiency is, of course, the beginning of fatigue, but fatigue is still a shadowy affair and its beginning hard to determine.

"Four factors play predominant rôles in the attainment of maximum efficiency, viz., the rate of the performance of work, the amount of rest offered or taken by the subject, the rhythm with which the work is performed, and the work habits developed by the worker."

"The glorification of that much misused half truth 'Time is money,' is responsible for much false physiology. Farmer, in a recent report to the Industrial Fatigue Board, laid, I think, the correct stress on the relation of speed to general industrial efficiency when he wrote: 'No movement can be compared with another and said to be better than it merely on account of its speed; it should only be compared in respect to ease and final result.' This is a good answer to those who believe that maximum efficiency can be best obtained by mere speeding up." . . . There is, besides, "a definite rhythm in the output in the course of the working day and the working week. Forced work, i. e., carried out at a pace other than that of the performer's own selection, is much more destructive than when the subject is permitted to work at a rate of his own selection."

"Rest is best obtained not by simple quiescence but by change of posture; slow movements of another type to that which produced the fatigue will, unless the organism is tired practically to complete exhaustion, give the most beneficial results."

Nutrition is essential for productivity and "not only the quantity but the quality of food consumed plays a part in the fitness of the individual to perform hard muscular work. . . . It is very difficult to believe that the farreaching common belief in the efficiency of a high meat intake, despite scientific evidence to the contrary, is without some foundation."

"Another important factor in general efficiency is the response of the organism to the multiple psychic imponderabilia which compose such a large part of the average environment. . . . In this connection monotony of work must be considered, the temperament of the operative playing an enormous part in the determining whether or no any particular operation is a monotonous one."

Lighting, heating, ventilation, housing and the life of the worker outside of work hours have their influence on output. "In other words, the real industrial efficiency of the worker cannot be causally related to any single factor. . . . The quest of efficiency involves the whole welfare of our race and nation, and calls for the closest and most intimate cooperation between the scientific investigator, the employer and the employee. It is no more capable of being settled on a communistic than on a capitalistic basis; it can only be satisfactorily attacked when mutual distrust of motives, capacities, and methods is stilled."

THE ASTHENIC MANIFESTATIONS OF INFLUENZA

The asthenic manifestations complicating influenza during its evolution or decline have been known for some time, but it has been only within the last few years that we are beginning to understand them. We now know that the phenomena commonly observed during the evolution or following the major infections are dependent upon suprarenal insufficiency, such as tachycardia, weak and irregular cardiac beats, low blood pressure, pallor, vomiting, anorexia, incoercible diarrhea, syncope and sudden death.

The suprarenals play essentially an antitoxic part; they destroy the poisons elaborated by the body, especially (as Brown-Séquard long since established) toxins originating from the muscles. But they also assume the function of destroying and neutralizing certain exogenous poisons, among them microbic toxins. These glands, small in size but great in importance, are not only endowed with these antitoxic properties; but also they elaborate a substance—adrenaline—which is probably secreted by the cortical layer in the form of proadrenaline, which is afterward found in the medullary strata in the form of adrenaline, which is detected by certain reagents. This product exercises a tonic action on the cardiovascular musculature, raises the blood pressure, maintains it at a proper height and hence plays the part of a regulator of the highest order.

Let it be supposed that the suprarenals have been pathologically changed by an infectious process, such as influenza—this, especially, because this particular infection appears to have an almost specific action on these glands. The secretion of adrenaline becomes interfered with and is imperfect, the larger portion of the glands being destroyed by material, morbid changes—hemorrhage, softening, etc. The result will be that the blood pressure falls so that soon a tendency to syncope, with tachycardia and palpitation, develops, the patient becoming incapable of the slightest effort. Thus, a syndrome of suprarenal insufficiency is constituted, the results of which are not long in making themselves felt.

But the suprarenals have other functions. The cortex secretes other substances, particularly lecithine, which is indispensable for the proper functioning of the nervous system. If lecithine is wanting, or secreted in insufficient amount, the nutrition of the nervous system suffers, its tonicity diminishes and it becomes functionally weak. Physical and moral depression ensues, to such an extent that the patient becomes incapable of exercising his will power or mental force. These unfortunate manifestations of suprarenal insufficiency are precisely those that develop during the evolution or decline of influenza, hence the asthenic manifestations of influenza are dependent upon a cortical or medullary insufficiency of these glands.

It therefore follows that opotherapy is the treatment of choice. When cardiovascular phenomena predominate adrenaline should be exhibited, whereas, when asthenia is marked, lecithine is perhaps indicated. We say *perhaps,* because clinically it is often most difficult to decide which of the two insufficiencies is in play. Kola and strychnine should be combined with adrenaline to hasten recovery and relieve the asthenia and cardiovascular disturbances.

COMMUNICABILITY OF PNEUMONIA.

Until very recently the pneumonias have been looked upon as developing from sources of infection within the patient. It is becoming more and more obvious, however, that pneumonia is a communicable disease in a large proportion of instances, and that in the handling of cases of the disease this fact should be borne in mind. The latest views on the subject are thus put by Dr. Francis Blake, of Yale: "It has been thoroughly established that infection in lobar pneumonia caused by pneumococcus types I and II, comprising approximately sixty per cent. of all cases, is not autogenous, but is due to the introduction of virulent strains from outside sources. It has been shown that the possible sources of infection are, first, cases of lobar pneumonia; second, individuals who have been in close contact with cases and have thereby become carriers of the disease producing types of pneumococci, and third, the dust from the immediate environment of cases of lobar pneumonia. In view of these facts it would seem incumbent upon us to regard lobar pneumonia as a communicable disease and treat it as such since every case must be traceable either directly or indirectly to some preceding case. In other words, it would appear desirable to practise as rigid isolation and quarantine measures in the case of lobar pneumonia as are now used in the handling of cases of epidemic meningitis or of diphtheria."

It is especially important that we take precaution against the spread of pneumonia since the mortality from the disease is so high. That it is not as highly contagious as some diseases should not make us less mindful of its infectious character.

That it is communicable receives support not only from the study of individual cases but from the statistics of mortality. The average death rate for pneumonia for a period of twenty years varies greatly in large cities located in different regions of the country and a comparison of these rates with those for the influenza epidemic shows that the two bear a close relationship, a city having a low death rate for one showing a low rate for the other and vice versa. The reason for the small or large death toll can only be guessed at, but it is doubtless to be found in the usual general causes, of propinquity of persons (whether in homes, workshops, or public conveyances) and in the general conditions of welfare of the inhabitants. That the death rate was high or low with both diseases is significant that those diseases were received gratuitously by one person from his neighbor.

INFANT AND CHILD HYGIENE

Is infant and child hygiene, or welfare, as it is termed in Great Britain, making the progress that it should make in this country? This question is suggested by a paper by Dr. Eugene R. Kelley, read at a meeting of the Massachusetts Medical Society, held in Boston on June 13th last. Dr. Kelley's paper dealt with the matter of child hygiene, and he seemed to think that greater advance had been made in this direction in England and Wales than in this country. He gives a talk in which he shows the truly remarkable rate of growth of the maternal and child hygiene movement in England and Wales during recent years. He refers especially to the large number of maternity and infant welfare centres, of nurse workers, and to the infant mortality rate. He might, with equally good reason, have drawn attention to the report of Sir George Newman, chief medical officer of the Board of Education, issued a few weeks ago. In England and Wales it is only since the inspection of school children was instituted that the public has learned how much unnecessary suffering exists in their midst. As the writer of the report says: "The school medical service has unveiled the physical condition of the children of the nation. It has shown the kind of physical impairment from which they suffer, its degree, its scope, and its disability. It has thrown light on the causes of such impairment and the means by which they may be avoided or removed. It may be added that medical inspection in schools in England and Wales has worked wonders in social, mental and physical betterment. At the present time the British school child, liable to inspection, is cleaner, healthier, and better clad than ever before; and for this encouraging state of affairs it is certain that medical inspection may claim a large share of the credit. As a matter of fact, the maternity and child welfare center in England and Wales is one of the most recent movements in preventive medicine, and its progress and development during three or four years has been astonishing."

The first infant welfare centre was founded in Ghent in 1901, and its introduction into England was mainly, if nor wholly, due to Dr. Eric Pritchard of London. The maternity and child welfare centre is now said to be more popular than the school clinic, and rightly so; because it is more preventive in its operation than any other branch of state medicine. It is obviously more effectual and more really prophylactic than the school clinic for the reason that it anticipates much of the work of the latter institution. It is curious to note that in England and Wales the procedure was to "put the cart before the horse" so far as the treatment and care of infants and children is concerned. The Medical Inspection of School Children Act was passed in 1907, and the Maternity and Child Welfare Act not until 1918. Of course, the success of such legislation depends almost wholly on its operation, and this in turn depends on the personnel of the organization which operates it. The skill and knowledge of the personnel hinges very largely on those who direct the movement and inform what may be termed the rank and file as to how to go about the proper performance of their duties; and this is the point which somewhat worries Dr. Kelley and with which his paper is chiefly concerned.

He shows that in this country there is a very definite tendency toward the development of nonmedical leadership in child hygiene with all the attendant dangers to the cause that such development entails. He is, therefore, of the opinion that the specialty of pediatrics should not merely continue, but should greatly extend its leadership in the child hygiene movement. But to do this, he argues, the doctor himself must be thoroughly trained in child hygiene, or how can he give information to others?

The present methods of teaching medicine are mainly clinical; at any rate, preventive medicine does not enter, to any extent, into the curriculum and Dr. Kelley urges that, in order to take the lead in and direct the child hygiene movement, the pediatrist, or would be pediatrist, must either train himself or be trained in this branch of preventive medicine. It assuredly does seem eminently reasonable to take the stand that the physician should direct the movement and more ethical to urge that the physician—the pediatrist in particular—should be trained in child hygiene, in order that they can instruct the nurse and social worker in all the essential details. If they cannot do this they had better not interfere, for nurses and social workers will soon lose faith in and have some contempt for a man who cannot answer their questions correctly.

It is said by some that the remuneration is so poor that doctors can hardly be expected to interest themselves in the matter. If that is the case, steps should be taken to remedy this state of affairs. It is false economy: the laborer is worthy of his hire. Moreover, it must be borne in mind that infant and child hygiene and school medical inspection are the most hopeful form of life insurance.

When the health and prosperity of a nation are in question money should be a secondary consideration. The physician, and especially the pediatrist, is absolutely essential to the success of the movement, as the nurse and social worker can advise only as to care, diet, etc., and not as to medical or surgical treatment. This lies in the province of the physician. On the other hand, as Dr. Kelley insists, the pediatrist, and to a lesser extent, the general practitioner, should be able to advise from the standpoint of preventive medicine.

X RAY AND CLINICAL FINDINGS IN CHESTS OF CHILDREN.

With a view to increasing the quantity and character of research work in problems related to tuberculosis, the National Tuberculosis Association some time ago appropriated $20,000 and appointed a committee composed of Dr. William Charles White, medical director of the Tuberculosis League of Pittsburgh; Dr. Paul A. Lewis, director of the laboratories of the Phipps Institute, and Dr. Allen K. Krause, director of Kenneth Dows Research Fund, to expend these funds to the greatest advantage. This committee decided that the best use of this money would be to assist researches already under way that held greatest promise of increasing the practical knowledge of physicians dealing with tuberculosis. This plan was carried out in cooperation with the universities. One of the researches was an effort to establish the x ray and clinical findings in the chest of a normal child up to ten years of age. For this problem the National Tuberculosis Association nominated Dr. H. K. Pancoast and Dr. H. R. M. Landis, of the University of Pennsylvania; Dr. F. H. Baetjer and Dr. C. R. Austrian, of Johns Hopkins University, and Dr. H. K. Dunham and Dr. K. D. Blackfan, of the University of Cincinnati. The report of these physicians has recently been issued under the title *The X Ray and Clinical Findings in the Normal Chest of the Child.* In all over five hundred children were studied; most of them were tested with tuberculin, others by the intracutaneous method. Facts detailed at some length in the report established the major thesis that, clinically, the ideal, normal child is a hypothetical impossibility. "Children, apparently healthy, symptom free and active, show on careful examination many deviations from fixed standards, variations that must be interpreted as within physiological limits; standards of height and weight must be elastic; pressures of resonance and of resilience of the chest must not be rigid and estimates of acoustic phenomena must permit of a range of difference from the ideal. These facts clinical experience establishes beyond peradventure, and they suggest a corollary, namely, that x ray examination of the chest of such children may be expected to show comparable deviations from a fixed ideal röntgenogram.

The studies reported, fortified by past experience, warranted the following conclusions:

1. The data obtained on percussion and auscultation of the lungs of normal children show wide variations from a fixed standard. These variations are usual and considered to be within normal limits.

2. Inasmuch as the changes referred to are dependent often upon alterations that persist as the residua of past infections of the respiratory tract, it is obvious that a careful anamnesis, with special reference to all infections, is necessary if diagnostic errors are to be avoided. Even a history carefully taken is often unreliable, as minimal infections are soon forgotten by many and among the unintelligent classes even more significant indispositions are not readily recalled.

3. Failure properly to evaluate these deviations from a fixed standard will often lead to the unwarranted diagnosis of disease and to even less justifiable treatment.

4. With a proper appreciation of the widest variations that the normal may present from the ideal, the informed clinician is better able correctly to understand the findings of the röntgenologist, and each, cooperating with the other, is less liable to error.

5. D'Espine's sign as indicative of enlarged tracheobronchial lymph nodes is of little value.

6. Recognition of and familiarity with the foregoing data are of cardinal and practical importance to every patient, potential and established. Without a proper appreciation of the facts set forth, no intelligent differentiation between a normal and an abnormal respiratory tract can be made.

In brief, to establish the presence or absence of disease, it is imperative that all data—clinical, laboratory and röntgenographic—must be evaluated and correlated and that no one fraction of the evidence be stressed to the exclusion of another.

A TRAVELING DRUG STORE IN RUSSIA.

In the effort to combat disease in Russia during the summer, especially in remote outlying districts difficult of access because of the prevailing unsatisfactory transportation conditions, the American Relief Administration secured from the Soviet Government the use of a special sanitary train. This consisted of seventeen cars loaded with all kinds of hospital equipment and medical supplies, and provided living, sleeping and office accommodations for personnel. The train left Moscow on August 3d for a month's tour of cities and towns that had had, up to that time, no medical assistance. In the course of its travels it visited seven large cities and several villages, and furnished 1,258 hospitals, dispensaries and children's homes, all of which had a capacity attendance, with the supplies necessary for combatting the diseases now prevalent in Russia. An attack on some of the widespread evils of present sanitary conditions was made by the distribution, throughout the outlying regions visited by this traveling drug store, of 10,000 cases of soap. When we remember that the districts reached by this train are all outside the famine section proper as covered by the American Relief Administration, and that this original famine section covers an area with a population of more than seventy millions, we realize the vast scope of the relief work and the crying needs of the whole country.

An interesting account of the delivery of the first boat load of food and medical supplies to the stricken population of the district of Sarapol is reported by the two physicians in charge. A mass meeting was held on the evening of their arrival. Here the two Americans explained that the food they had brought was to be used for supplying eighteen thousand children and hospital patients with one supplementary meal daily for a month, and that it would be supplemented by a shipment of America's twenty million dollar gift corn which would be sufficient to ration the same number of adults. A committee was then chosen to allocate and distribute the food to towns, villages and institutions of the district. This procedure was explained in detail to the committee, and it was announced that food from America would be forthcoming to tide over thirty-six thousand persons until crops could be harvested. There was great applause and rejoicing by the people at this announcement. Other supplies turned over to the committee for use and distribution were enough tetravaccine for the inoculation of thirty thousand persons, several barrels of cod liver oil for the combatting of scurvy, several other drugs which had not been seen in Sarapol for a number of years, an ample supply of clinical thermometers, rubber goods, blankets, soap, hypodermic syringes and other hospital necessities.

The millions of dollars' worth of medical and hospital supplies in Russia at the present time, which are being used by the American Relief Administration in their fight against disease and frightful unsanitary conditions, were contributed by the Red Cross and the Government of the United States.

INFLUENZA IN FRAMINGHAM.

The Framingham Community Health and Tuberculosis Demonstration of the National Tuberculosis Association has recently issued a pamphlet on the influenza epidemic and postepidemic as observed in Framingham. The machinery of the health demonstration made possible exceptional opportunities for cooperation with various agencies in fighting the epidemic. There were also probably unique opportunities for observation of the effects upon the population, especially the tuberculous. "Consequently, for the first time, so far as is known, a normal urban population group, following an influenza epidemic, has been studied, not only statistically by mortality and by morbidity reporting, by nursing visits, correspondence, etc., but also through actual thorough physical examinations by specialists in thoracic disease."

The main body of the report consists of the conclusions drawn from the medical investigations. Methods of control are outlined, as applied in the epidemic and postepidemic periods. These efforts at control should be applicable to many communities, and are valuable as an illustration of the fairly complete utilization of all available resources, even though they were used in a fight more or less hopeless in its outcome.

News Items.

Commissioner Copeland Elected Senator.—Dr. Royal S. Copeland, Commissioner of Health of the City of New York, was elected United States Senator at the recent election.

Commissioner Hamilton Elected Secretary of State.—Dr. James A. Hamilton, who has served the city of New York as commissioner of correction for several years, was elected Secretary of State for the State of New York on the Democratic ticket by a considerable majority.

Maternal Death Rate in New York.—The State Department of Health reports that the rate of deaths for New York city from all maternal causes was forty-seven in ten thousand and for the rest of the State, sixty-six in ten thousand.

Harvey Society Lecture.—The second of the series of Harvey lectures was delivered on Saturday evening, November 11, 1922, by Dr. August Krogh, professor of physiology at the University of Copenhagen. His subject was Nervous and Hormonal Control of Capillary Contractility.

Anniversary Discourse at the Academy of Medicine.—Professor E. G. Conklin, of the Department of Biology of Princeton University, delivered the anniversary discourse of the New York Academy of Medicine on Thursday, November 2d, his subject being Problems of Organic Adaptation.

Special Course in Neuropsychiatry.—The United States Veterans' Bureau offers a special course in neuropsychiatry to a certain number of qualified physicians on condition that, upon the completion of such course, they will continue in the service of the bureau for a period of at least two years thereafter.

Sanatorium Endowments.—Two endowments of beds in the sanatorium of the Consumptives' Relief Society at Denver, Col., were announced recently. One of them was in memory of Jacob and Julia Wodiska by their son, Julius Wodiska, who is an importer of precious stones, and an authority on that subject. The other bed was donated by Noah Sheifer in memory of his wife, Julia Sheifer.

Public Lectures at the Academy of Medicine.—The public lectures announced for November and December at Hosack Hall, New York Academy of Medicine, are of especial interest at this time. On Wednesday, November 22d, Dr. Frankwood E. Williams will speak on Mental Hygiene Problems of Hygiene and Adolescence and on Wednesday, December 6th, Dr. Frances Cohen will have a paper on Health Education for Children. The latter will be illustrated with motion pictures.

New York Neurological Society.—The New York Neurological Society held its regular three hundred and ninety-ninth meeting at the New York Academy of Medicine, on Tuesday, November 14, 1922, jointly with the Neurological Section of the Academy of Medicine. Papers were read by Dr. Lewis Stevenson, by Dr. Byron Stookey, illustrated with lantern slides, and by Dr. Michael Osnato. The next meeting will take place on December 5, for the purpose of nominating officers for the year 1923. Officers for this year include Dr. Foster Kennedy, president, and Dr. Charles E. Atwood, secretary.

Medical Society of the Missouri Valley.—Dr. Floyd H. Spencer, of St. Joseph, Mo., was elected president of this association at the thirty-fifth annual meeting held at St. Joseph, Mo., on September 21st and 22d. Other officers were elected as follows: Dr. W. S. Stotler, of Shenandoah, Ia., first vice-president; Dr. Palmer Findley, of Omaha, second vice-president; Dr. O. C. Gebhart, of St. Joseph, treasurer (reelected); Dr. Charles Wood Fassett, of Kansas City, secretary (reelected). The next annual meeting will be held in Omaha.

Boylston Medical Prize of Harvard University.—Announcement has been made by the Boylston Medical Committee of a prize of $500 and the Boylston Prize Medal for the best dissertation on the results of original research in medicine, the subject to be chosen by the writer. The medal will be added to the money prize only in case the winning essay shows special originality in the investigations detailed. Dissertations entered for this prize must be in the hands of the secretary, Dr. Reid Hunt, Harvard Medical School, Boston, Mass., on or before February 1, 1923. Information also may be had of Dr. Hunt at the same address.

Distinguished Service Medal Award.—Dr. John B. Walker, Colonel, Medical Corps, of New York, was presented with the Distinguished Service Medal at the offices of the Commanding General at Governor's Island. The citation reads: For exceptionally meritorious and distinguished services as commanding officer of Base Hospital No. 116, American Expeditionary Forces, and later as consultant in the United States during the period of mobilization. The services rendered by Colonel Walker in standardizing and supervising the treatment of the wounded suffering from gunshot fractures were of inestimable value to the Government and a material contribution to the rehabilitation of the disabled.

The Tallest Hospital in the World.—The cornerstone was laid on Sunday, November 5th, of the new Beth Israel Hospital in Livingston Place, New York. The structure, which will be the tallest hospital building in the world, will cover a plot 123 by 184 feet, will have four floors below the street level and fourteen floors above. In the lowest basement will be the boiler room and oil tanks, with a capacity of forty thousand gallons. The subbasement will contain also storage rooms and the refrigerating plant. A diagnostic clinic, the only one of its kind, will occupy one end of the first floor. The remainder of the first floor will be used by the social service department, the emergency department and the lecture auditorium, which will also be used for entertainments and religious ceremonies. The second floor will be used for the executives' offices, the interns' quarters and the x ray department. The third floor is given over to children, a playroom, roof garden and infants' and children's department occupying the entire space. The maternity department is on the fourth floor. The fifth, sixth, and seventh floors are used for private rooms; on the eighth is the therapy department; on the ninth private rooms and rooms for convalescent patients on the tenth. On the eleventh floor will be a laboratory for experimental and research work; on the twelfth the operating rooms; on the thirteenth the solarium, and on the fourteenth, the nurses' lecture room.

Railway Surgeons.—At the annual meeting of the American Association of Railway Surgeons held at the Hotel Sherman, New York, October 18th to 20th, officers were elected for the ensuing year as follows: President, Dr. John H. Rishmiller; vice-presidents, Dr. Duncan Eve, Jr., of Nashville, Tenn.; Peter A. Nestos, of Minot, S. Dak., and John W. Martin, of Des Moines, Ia.; secretary, Dr. Louis J. Mitchell, of Chicago. Dr. S. C. Plummer, of Chicago, was reelected a member of the directorate.

American Public Health Association Meeting.—The important event connected with the fifty-first annual meeting of this association at Cleveland this year was the adoption of a new constitution which changed fundamentally the plan of organization. The direction is intrusted to a group made up of the fellows of the organization. Four other classes of membership are provided for, with differing qualifications as to dues, etc. Other matters taken up were of a formal character. Officers for the year were elected as follows: President, E. C. Levy, of Richmond, Va.; first vice-president, Henry F. Vaughan, of Detroit; second vice-president, Gabriel M. Malda, of the National Department of Health, Mexico; third vice-president, H. L. Rockwood, of Cleveland; executive secretary, A. W. Hedrich, of New York; treasurer, Roger I. Lee, of Cambridge, Mass.

American Electrotherapeutic Association.—At the thirty-second annual meeting, held in New York, September 19th to 22d, officers were elected for the coming year as follows: Dr. Frank E. Peckham, of Providence, R. I., president; Dr. Harry E. Stewart, of New Haven, Conn., Dr. T. Howard Plank, of Chicago, Ill., Dr. Robert J. Henderson, of Reading, Pa., Dr. Victor C. Pedersen, of New York, and Dr. Willard P. Whittington, of Asheville, N. C., vice-presidents; Dr. J. Willard Travell, of New York, was reelected treasurer; Dr. A. Bern Hirsh, of New York, was reelected recording secretary, and Dr. Richard Kovacs, of New York, was reelected corresponding and financial sécretary. Board of trustees: Dr. William Martin, of Atlantic City, N. J.; Dr. Frederick de Kraft, of New York; Dr. Byron Sprague Price, of New York; Dr. Frederick H. Morse, of Boston, Mass.; Dr. Virgil C. Kinney, of Wellsville, N. Y.; Dr. William D. McFee, of Haverhill, Mass.

Died.

Field.—In Red Bank, New Jersey, on Friday, October 27th, Dr. Edwin Field, aged seventy-three years.

Nahm.—In New York City, on Wednesday, November 1st, Dr. Ida C. Nahm, aged fifty-five years.

Reese.—In Phillipsburg, N. J., on Sunday, November 5, Dr. James Mitchell Reese, aged sixty-four years.

Shere.—In Denver, Colorado, on Wednesday, October 18th, Dr. Oscar M. Shere, aged forty-four years.

Thacher.—In New York City, on Saturday, October 28th, Dr. John S. Thacher, aged sixty-six years.

Twohey.—In Buffalo, New York, on Sunday, October 29th, Dr. John Joseph Twohey, aged sixty-one years.

Von Ruck.—In Asheville, N. C., on Sunday, November 5, Dr. Carl Von Ruck; aged seventy-three years.

Wright.—In Belleville, New Jersey, on Monday, October 30th, Dr. Laura M. Wright, aged eighty-two years.

Wood.—In Gloversville, New York, on Tuesday, October 31st, Dr. William C. Wood, aged sixty-four years.

LONDON LETTER.

(*From our own correspondent*)

LONDON, *September 29, 1922.*

POOR LAW RELIEF IN GREAT BRITAIN.

Some staggering facts with regard to poor law relief in Great Britain have just been published by the Ministry of Health. It is shown by this report that one in twenty of the people of this country at the present moment are subsisting on poor law relief, that is to say, living wholly on charity. In addition to poor law relief there are many other agencies at work administering maintenance in one form or another to a large number of people who are withdrawn from productive work by various disabilities, sickness, old age, and infirmity, besides the widespread inability of ablebodied men to find occupation. It perhaps would not be an exaggeration to say that probably one in fifteen of the British population is being maintained now by contributions, levies on the general resources of the community; consuming without replacing; being carried by the community without contributing to the production of the common resources.

Of course this is an absolutely appalling state of affairs. In the normal course of events, every healthy civilized community has to reckon upon devoting a certain proportion of its resources to the maintenance of the noncontributing classes of the community. In childhood and old age, before and after the period of capacity for contributing to the common resources, maintenance is a necessary charge upon the activities of the working community. Sickness and accidents and various other causes swell the list, and a civilized community is under the human obligation of meeting, out of the working productivity of its efficient working life, all these charges. The circumstance, however, that is not normal is that a large proportion of the ablebodied and willing men and women of the nation, in the period of their working efficiency when they repay the cost of their childhood and earn the right to retire when they grow old enough, should be thrown for maintenance upon public funds through sheer inability to find occupation. The present poor law system cannot cope with the situation. Its social organization was never designed to meet such needs, and its methods intended to meet quite different circumstances are incapable of dealing effectually with existing conditions.

The two main principles of poor law relief in this country in an endeavor to relieve ablebodied destitution are that no aid shall be given except by a test of work; and that such aid shall be less than the amount which can be earned by the lowest paid labor. It is obvious that these conditions are necessary in dealing with ablebodied destitution under ordinary circumstances. They are conditions based on the assumption that giving relief to ablebodied men, except by way of hard labor and at less reward than attaches to the usual kind of work, will induce men to rely upon relief instead of engaging in such work. It assumes that the alternative of the usual routine work exists, and that individuals must be induced to take to that alternative by the deterient conditions of relief. But now in this country for large masses of men and women this assumed alternative has ceased to exist. Regular employment for these masses is nonexistent and therefore the attempt to deal with masses of honest men and women who are only too anxious to get back to regular employment, by the deterient principles of the poor law and on the fake poor law assumption that they will find regular employment if only conditions of relief are made hard enough, cannot but fail, and is at the root of the present irritation and general feeling of tension and unrest. In this country there is no social organization for meeting successfully this unprecedented and untoward state of things, for the reason that no such widespread failure of the ordinary processes of trade to find employment for the nation has ever occurred previously. Prevalent conditions are a legacy of the war which has turned the world upside down and destroyed, for a time at any rate, international trade. In present circumstances all nations are more or less interdependent. No nation can stand absolutely alone but the trouble is that as things are trade is completely dislocated. What the world wants is peace, real peace, and that is the root of the whole matter. Real recovery depends upon the achievement of a real peace of renewed intercourse and the maintenance of good will between all the nations of the world. Patently, too, it is a question most intimately affecting public health, and not only the health of one nation but the health of the people of the world at large. When unemployment exists poverty stalks abroad and disease is the companion of poverty. An ill nourished body and a troubled mind afford fruitful soil for diseases of every kind. The Near East of Europe at the present time, with typhus, the outstanding disease of dirt and destitution, raging almost unchecked, constitutes a menace to civilization, and if peace is not brought about in that cockpit of Europe, conditions must go from bad to worse.

The present situation concerns closely the medical profession of the world. To aid in achieving universal peace would be to aid in the greatest effort of preventive medicine ever attempted. A successful attempt would save the world spiritually and physically.

DIET AND NUTRITION.

A memorandum on Diet in Relation to Normal Nutrition, by Dr. J. W. Hamil, one of the medical officers of the Ministry of Health, has just been issued by that department. It covers the question of vitamines and recapitulates all that is known and surmised of these accessory food factors. It emphasizes the point that milk and green vegetables afford a means of raising any ordinary diet into the plane of safety, and pending further knowledge it lays stress on the belief that little fear may be entertained as to the satisfactory nature of any mixed diet which milk and green vegetables enter, provided, of course, that the diet is sufficient in amount to afford the necessary supply of energy. The memorandum draws attention to the fact that it is not possible to say how much milk a diet should contain; but it would appear desirable that during the period of growth, at any rate, the amount of milk in the daily diet should be somewhere near a pint; it might with advantage be even more. A pure and abundant milk supply readily procurable by all classes, is one of the essential factors in any sound scheme of nutrition. In adult life the need for certain essential constituents, vitamines, is probably less than during the period of growth, so that a diet which is satisfactory during this period is almost certain to be adequate for adult life, assuming that a sufficient energy supply is assured. In order that a dietary should include all the essentials for nutrition, it should be as varied as possible. All available evidence indicates the undesirability of limiting a diet to a few varieties of food material. When a diet is supplemented with milk and green vegetables, the food materials of which it is composed may quite satisfactorily consist of articles which are easily obtained and relatively cheap. Many of the more expensive and luxurious foods are superior only in regard to esthetic qualities.

As said before, a good deal is known concerning vitamines and more is surmised. Our knowledge, however, in this direction is by no means exact as yet. As a matter of fact only three different vitamines have been distinguished. So far as the value of milk as a food is concerned, opinions differ. It is allowed on all hands that it is the ideal food for the young, but there are some authorities who hold the view that when a child has its teeth it should use them in eating food that requires mastication, and that milk should be relegated to the background. At any rate, it should no longer be the main article of diet. Dr. Harry Campbell is the apostle of these views and he has a large following.

LESSONS OF WAR SURGERY.

The official history of the British War Medical Services, *Surgery of the War,* Vol. 1, Edited by Major General Sir W. G. Macpherson, Major General Sir A. A. Bowlby, Major General Sir Cuthbert Wallace, and Colonel Sir Crisp English, was issued recently. It has been said that while the war had not tended to any particular advance in medicine, it had influenced the progress in surgery in a most remarkable manner. However, a close study of this volume does not substantiate this statement. It is true that advance was made in certain branches of surgery, but no greater than in a period of corresponding length during peace time. At first thought it seems wonderful that the unique opportunities for studying wounds in every part of the human body did not result in increasing our knowledge of traumatic surgery, but when the matter is considered more closely it will be better understood why surgeons engaged in war work failed or were unable to gather and store knowledge from the unparalleled facilities for so doing which came in their way. To begin with, they were overwhelmed with work, and the conditions of war are not calculated to create an atmosphere conducive to quiet meditation, a *sine qua non* for effective research work, and moreover there were only a few who were endowed with the power of concentrating on some of the numerous problems which called for solution. Among the articles of the book which demonstrated progress, those of Lieutenant Colonel G. M. Cowell and Captain J. Fraser dealing with shock are almost the best. The question of shock is discussed adequately and thoroughly in all its phases and perhaps especially so in all that regards methods of prevention and treatment. Another measure of great surgical and medical import which war conditions improved and which proved its worth was that of blood transfusion. This valuable procedure was placed on a firm foundation and it can now be used as a routine mode of treatment when required. Major G. Gordon Taylor and Captain K. M. Walker contribute a fascinating article on blood transfusion which is assuredly one notable surgical measure in which the war induced progress and concerning which much knowledge has been gathered. Major General Sir George Makins and Colonel C. T. Bond wrote on the general treatment of wounds in which no great advance was made. Major General Sir Cuthbert Wallace gives a description of gas gangrene of which little was known prior to the war. The pathology of the disease was thoroughly studied but in other directions our knowledge has not been added to any extent. The knowledge of the pathology of trench foot remains practically in *statu quo.* Prophylactic treatment was somewhat improved on. The surgical event of the war was the accumulation of lung injuries. This result was mainly owing to Pierre Duval, who showed that the mediastinum was to a considerable extent rigid, and this discovery altered the aspect of thoracic surgery. As a matter of fact the practical application of Duval's findings has rendered thoracic surgery comparatively easy and the technic of surgery of this region has been placed on a firm basis. As said before, although the war has been the cause of a valuable increase of surgical knowledge, its results on the whole in this respect have been distinctly disappointing and consequently the volume respects this disappointment.

NARCOTIC DRUG MENACE.

Mr. Basil Mathews, on his return from the meeting of the Opium Commission of the League of Nations at Geneva, spoke on the dope menace in this country, in which he gave some curious information on the trade in cocaine. Behind the street seller was the smuggler who brought the drug from Germany, Holland or other parts of the continent. The methods open to cocaine smugglers were so multifarious that they were extraordinarily difficult to catch. Many of the ingenious devices used, the double crowned hat, the hollow stick or shoe heels were now fairly widely known, but there were others innumerable. Across the channel the smuggler got the cocaine from a merchant who in most cases carried on another and perfectly reputable business, and the merchant was the agent for the actual factory.

Before the war, and doubtless at the present time, Germany possessed the largest and best equipped cocaine factory in the world, and there was also a large one in Holland. Mr. Mathews, however, was careful to point out that it was the abuse or rather the misuse of the drug that was so harmful, and he reminded his audience that it was a valuable local anesthetic.

GIFT TO UNIVERSITY OF LEEDS.

Sir Edward Allen Brotherton, Bt., M. P., has given £20,000 to the University of Leeds for the development of bacteriological study and research, more particularly in the interests of public health.

Book Reviews

SURGERY.

A Synopsis of Surgery. Illustrated. By Ernest W. Hey Groves, M.D., B.Sc., F.R.C.S. (Eng)., Surgeon to the Bristol General Hospital; Consulting Surgeon to the Gossham Hospital; Professor of Clinical Surgery, Bristol University; Examiner in Surgery, University of London. Sixth Edition. New York: William Wood and Co., 1922. Pp. viii-621.

This book resembles a quiz compend giving the etiology, diagnosis and treatment in the most condensed form. It is difficult for the reviewer to realize what value this type of book has. As a quiz compend it might be serviceable; to the ordinary practitioner it seems much too abbreviated to be of any real service. Its references to treatment are far too brief and often omit valuable aids. The arrangement of the book is similar to standard textbooks on surgery. The inadequacy of such a book is shown in the treatment of tuberculous nodes of the neck, which the author divides into palliative and operative. The palliative treatment is as follows: "By high feeding, fresh air and removal of all local sources of irritation." As you will see, no discussion has been given either of tuberculin or x ray therapy. Certainly these aids to treatment should be mentioned in any standard textbook. Moreover, it would be difficult for anyone to realize that the author suggests that tonsils should be removed as the source of irritation. It is well known that they are frequently the primary source of infection. In the discussion of tumors, bone pathology is limited and a common type, such as osteitis fibrosa cystica, receives scant consideration. Treatment by either x ray or radium therapy is not mentioned.

CORRECTIVE GYMNASTICS.

Individual Gymnastics. A Handbook of Corrective and Remedial Gymnastics. By Lillian Curtis Drew. Illustrated with 100 Engravings. Philadelphia and New York: Lea & Febiger, 1922. Pp. vi-225.

This book is primarily a handbook for women teachers of physical exercise for women and girls who wish to give special attention to physical deficiencies commonly met with in the handling of large groups in schools and gymnasia. It is admirably adapted to serve the needs of these teachers. It presents mainly exercises called corrective gymnastics for structural defects such as poor posture, scoliosis and weak feet and. less completely, exercises for medical conditions such as constipation, dysmenorrhea, visceroptosis and abnormal weight. In addition to the exercises there is comment on anatomy, diet, physiology, forms of record, equipment and auxiliary treatment of the conditions dealt with.

As a textbook on individual gymnastics it is most incomplete for its field is restricted to young women and it does not treat of many conditions such as heart disease, diabetes, chronic colitis, and neurasthenia, for instance, in the medical field, and many reconstructive features in the surgical field. It will not therefore supplant the works of Goldthwaite, Bucholz, R. Tait Mackenzie or Stewart, but in its field for its purpose it deserves high praise. It is practical, helpful and true. It contains the results of Miss Drew's many years of thoughtful, devoted experience in the field in which she is undoubtedly one of the best informed and most progressive. Her discussion carries the conviction of proven experience. A large part of the book is devoted to good posture and the practical ways of getting it; while the author does not avail herself of recent work on the subject, her discussion is the best as yet published in book form. Her discussion of scoliosis is concise and very practical, perhaps the best in the book, while those on constipation and visceroptosis are the least complete.

Its value to the physician lies first in the evidence that this book presents a well formulated method of physical training applied to a variety of deficiencies and diseases. If he can discover a specialist in his community as well as Miss Drew's pupils to work under his instruction he can do much for his patients. Individual physical training is a quasi medical procedure as yet little recognized by the physicians. It should be accepted and directed by the medical profession. At present patients are told to exercise—to walk, play golf, without a real prescription of exercise—or they are turned over to "professors" who run commercial "health studios." Dealing as it does with disease conditions we would have been glad to have seen Miss Drew recognize the fact that individual gymnastics are a form of medical treatment and as such should be prescribed and directed by physicians. Miss Drew's book will, however, help to show physicians what can be done by physical training teachers and to show physical training teachers how to live up to their opportunities.

X RAY DIAGNOSIS.

Principles and Practice of X Ray Technic for Diagnosis. By John A. Metzger, M.D. Roentgenologist to the School for Graduates of Medicine, Medical Department, University of California, Southern Division, Los Angeles. With 61 Illustrations. St. Louis: The C. V. Mosby Company, 1922. Pp. 144.

The author and publisher are to be congratulated upon the attractiveness with which the subject of the making of radiographs of every part of the anatomy is presented. Pictures showing the position of the patient, x ray tube and film explain better than words the technic for each locality. And the positions are in general so perfect that it seems ungracious to call attention to one or two which might be improved upon and doubtless would be if the author were giving a personal demonstration. The position for anteroposterior view of the ankle requires correction. The ray should be directed through the joint at a right angle to the long axis of the tibia and fibula, whereas in the illustration it is very oblique. The instructions contained in the book cover distance, voltage, milliamperage, intensifying screen when required, time of exposure and method of development. Pneumoperitoneum and the Bucky diaphragm are some of the modern subjects discussed; fluoroscopy is well described. The book contains no radiographs and is not concerned with röntgen diagnosis but it is the next best thing to personal instruction in radiography.

TESTICULAR GRAFTS.

Greffes testiculaires. Par Le Docteur Serge Voronoff, Directeur de la station de chirurgie experimentale du College de France, Directeur-adj. du laboratoire de biologie de l'ecole des hautes etudes. Avec 19 planches hors texte. Paris: Librairie Octave Doin, 1923. Pp. ix-83.

This book is worthy of careful consideration. The author has done what has heretofore been considered futile, and has managed to secure successful results. In this book he gives case histories, accompanied by authentic photographs of testicular grafts from monkey to man. His work is yet in its embryonal stage and represents a complement to the Vienna group of Steinach operators. It may be in the technic or in the careful selection of cases and material that Voronoff has succeeded where others have failed. At any rate, he has gone on courageously in a field which seemed hopeless at first. The technic is carefully explained in the present book, and from this point of view, it should be studied with care.

LIFE AND DEATH.

Aspects of Death and Correlated Aspects of Life in Art, Epigram and Poetry. Contributions towards an Anthology and an Iconography of the Subject. Illustrated Especially by Medals, Gems, Jewels, Ivories, Antique Pottery, etc. By Frederick Parkes Weber, M.A., M.D., F.R.C.P., F.S.A. Fourth Edition, Revised and Much Enlarged. With 146 Illustrations. London: T. Fisher Unwin, 1922. Pp. xliv-851.

In the fourth edition of this remarkable survey of the literature and art dealing with death and the correlative aspects of life, much material, direct and symbolic, is presented. As a reference text book it is exceedingly valuable.

DIETETICS.

Lectures on Dietetics.. By Max Einhorn, M. D., Emeritus Professor of Medicine at the New York Postgraduate Medical School and Hospital; Visiting Physician to the Lenox Hill Hospital, New York. Illustrated. Philadelphia and London: W. B. Saunders and Company, 1922. Pp. viii-244.

This modest book, written with great simplicity, is one that the practitioner cannot dispense with. Within its comparatively few pages more common sense is compressed than will be found in many books several times its length. Much ground is covered and sensible ideas abound. A short compend of the principles of diet and nutrition is followed by a very important chapter on the digestibility of foods. Then, in order, are taken up diet in chronic and acute diseases. An important, frequently overlooked topic, namely, the care of digestion, is given careful consideration, and the treatment of chronic diarrhea is followed by the treatment of diabetes. Gout and nephritis are discussed and the proper dietary treatment indicated. Diet for operative cases is specified; duodenal and rectal alimentation and artificial nutrition are discussed. Finally, there is a brief but extremely valuable chapter on the preparation of food for invalids.

As will be seen, a great deal of ground is covered in a very short space. The salient points are described and well described. Einhorn's long experience enables him to eliminate the extraneous and present the essential. There are few books in medicine today which are of more value than this small monograph.

DYSENTERY.

Nachkrankeiten der Ruhr. Von Professor Dr. H. Strauss, Direktor der inneren Abteilung des Krankenhauses der judischen Gemeinde zu Berlin. Albu's Verdauungs—und Stoffwechselkrankheiten. Bd. VII. Halle a. S.: Carl Marhold, Verlagsbuchhandlung, 1921. Pp. 61.

In this monograph Strauss gives a résumé of his rich experiences with the sequelæ of dysentery, which comprise most cases of chronic ulcerative colitis. The operation of appendicostomy or cecostomy frequently practised in the severer forms of this disease, must be considered as aids in the treatment of this condition. The general plan of dietetic and medicinal measures must be carried out at the same time. Ample nutrition, change of climate, iron and arsenic are frequently of great use.

BILIARY CALCULI.

La Lithiase biliaire. Par A. Chauffard. Clinique médicale de Saint-Antoine. Avec 26 planches hors texte. Deuxieme edition. Paris: Masson et Cie, Editeurs, 1922. Pp. 247.

Chauffard's book on biliary calculi is of great value. This well known author gives his rich experiences regarding the pathology of gallbladder troubles and adds many illustrations of his own. He attaches a great deal of importance to the dietetic treatment of gallbladder lesions. He forbids eggs, brains, liver, butter, and fats generally, also game and spicy foods. Everything containing cholesterin should be avoided. A large amount of meat is harmful by its effect on the liver (congestion). Concerning the medicinal treatment, Chauffard speaks highly of sodium salicylate and the mineral waters of Vichy and Carlsbad. The book, written by a great master, will be of great value to every practitioner.

FUNCTIONAL NERVOUS DISORDERS.

Functional Nervous Disorders. Their Classification and Treatment. By Donald E. Core, M.D. (Manc.), M.R.C.P.; Honorary Assistant Physician, the Manchester Royal Infirmary; Lecturer in Neurology, the Victoria University of Manchester. New York: William Wood & Company, 1922. Pp. xvii-371.

A vast lot of dogmatically described, long winded trash. There are more misstatements under the guise of pseudoscientific nomenclature than is usual in a book of this type. New and bewildering terms have no terrors for this author.

MEDICAL JURISPRUDENCE.

Insanity and Mental Deficiency in Relation to Legal Responsibility. A Study in Psychological Jurisprudence. By William G. H. Cook, LL.D. (Lond.) Thesis approved for the Degree of Doctor of Laws in the University of London. London: George Routledge & Sons, Ltd. New York: E. P. Dutton & Company, 1921. Pp. xxiv-192.

A distinct addition to medicolegal literature. It is painstakingly written and extremely lucid. The book should have a big reading in both medical and legal circles.

MEDICINE AND DENTISTRY.

Lehrbuch der Grenzgebeite der Medizin und Zahnheilkunde. Für Studierende, Zahnärzte und Arzte. Bearbeitet und Herausgegeben von Dr. Julius Misch. Zahnärzt in Berlin. Zweite Band. Second Edition. Leipzig: F. W. C. Vogel, 1922. Pp. 672.

This volume is the joint work of a staff of collaborators as follows: dermatology by Ledermann; gynecology by Büttner; rhinolaryngology by Finder; otology by Gutmann; occupational diseases by Koelsch. The editor has collaborated in each of these sections as a stomatologist. The book contains 351 illustrations, which include a number of fine colored plates. The two detached volumes, which make up the work of Dr. Misch, appeared originally in 1914 in a single binding. In the absence of the first volume it is impossible to give the present one an adequate review.

ACUTE ABDOMINAL CONDITIONS.

The Early Diagnosis of the Acute Abdomen. By Zachary Core, B.A., M.D., M.S. (Lond.), F.R.C.S. (Eng.), Surgeon to Out-Patients, St. Mary's Hospital, Paddington, etc. New York: Oxford University Press, 1921.

The special subject embraced under the head of "acute abdomen" are appendicitis, gastric and duodenal ulcers, acute pancreatitis, intussusception, cancer of the colon, volvulus of the colon, strangulated hernia, ectopic pregnancy, cholecystitis, colic peritonitis. There are also chapters on acute abdominal symptoms of normal gestation and parturition, acute abdominal symptoms of genitourinary conditions stimulating acute abdomen, and acute abdomen in the tropics.

ENDOCRINE THERAPY.

Endocrine Therapeutics. Practical Suggestions. B. Thomas Bodley Scott. Author of *Modern Medicine and Some Modern Remedies.* Philadelphia: P. Blakiston's Son & Co., 1922. Pp. x-118.

A lucid series of observations on endocrine therapy which should prove a valuable addition to the library of every physician. One of the noteworthy features in Scott's book is his advocacy of minimal doses. Endocrinology has been set back many years by the use of large quantities of various endocrine products. Another feature is the warning issued against the use of polyglandular shotgun mixtures. This type of therapy, while it may produce gratifying results in many cases, is not conducive to scientific study. On the whole a commendable little book.

PUBLIC HEALTH NURSING.

The Evolution of Public Health Nursing. By Annie M. Brainard. Editor of *The Public Health Nurse;* Lecturer on Administration of Public Health Nursing in Western Reserve University. Illustrated. Philadelphia and London: W. B. Saunders Company, 1922. Pp. xi-454.

A most interesting manual describing the history and development of nursing up to the present day. The book is exceedingly well written, the entire subject being handled in fascinating fashion with total avoidance of cheap, journalistic jargon. The reading of this book will tend to create a more sympathetic attitude toward nursing and those who are engaged in that most worthy, if somewhat thankless profession.

BISEXUAL LOVE IN FICTION.

Narcissus. By Evelyn Scott. New York: Boni & Liveright, 1922.

The case histories of Stekel's valuable contribution to sexual pathology seem to have been clothed by Mrs. Scott in novel form. We suspected the conscious psychopathological makeup of the characters in *The Narrow House.* In *Narcissus* the same principals continue to involve themselves, airing their morbidity still more openly.

From Winnie, Laurence Farley's hysterical first wife, it is a step more nearly in the direction of a combined sister-mother image that he projects in Julia, his second wife. No item of abnormality is overlooked in her, from her fondness for green, her affair with an effeminate artist whose homosexuality glares from every page, to her administrative work in women's politics, while her lover's character is summed up almost in the words of a diagnosis of an inferiority complex. Mother Farley of *The Narrow House,* and Alice, the "queer" aggressive sister, the one, intense hysterical repression, the other, vitality sapped by internal conflict, both are merged for Laurence's destruction in the second wife. Every character in the book is a doomed narcissus. We wish Noah's flood had got them in the first place.

KNOW THYSELF.

Babbitt. By Sinclair Lewis. Author of *Main Street.* New York: Harcourt, Brace and Company, 1922. Pp. 401.

Wings that flutter a little under the burden of life's futility, struggle desperately, slip again into complacence, this is the pattern of Babbitt's soul. And there are an infinity of Babbitts in this country, similarly lapsing into "normalcy." Sinclair Lewis's book is a bitter cry, a flaying of conditions intellectual and selfish. This keenest of satires shows devastatingly what we are coming to. It explains why it is that intelligence tests have eighteen years as the summit of intellectual age. It pictures the rabble playing its lifetime out on the threshold of adolescence. Much may be said of this book. It may serve only to amuse, it may stimulate to a readjustment of bourgeois values. At least for an uneasy instant it will enable the reader to know himself.

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Medicoliterary Notes.

The Health of Missionaries in Korea is the title of a comprehensive and detailed study by Dr. J. D. Vanbuskirk and Dr. F. M. Stites in the *Korea Mission Field* for August. The study was made by these two physicians under the auspices of the Research Department of the Severance Union Medical College at Seoul, Korea, and represents probably the most careful and complete investigation, with tabulation of results, ever made along this very special line of medical research.

* * *

Up to the present time modern methods of treating disease and of sanitation have existed in China only in a few of the larger centres of population. Now, however, according to a statement recently made public by the Rockefeller Foundation, the Chinese are beginning to show initiative and assume responsibility in the teaching of modern science and its application to medical education and public health problems. The Rockefeller Foundation has made two gifts toward this end in China, one to the Southeastern University at Nanking, the other to the Nankai College at Tientsin for science buildings and equipment. Each gift amounts to $125,000, and both are to be used for giving premedical courses in science to Chinese students. Hitherto the appropriations of the foundation have been used exclusively for the medical education of persons who had received already premedical training.

* * *

Travel to the sanitarium of the Mayo brothers, Rochester, Minn., so it is reported, has increased so greatly within the year that the Chicago & Northwestern Railway has added a train to its daily service to handle it.

* * *

Dr. Joseph A. Stearns, sanitary expert of the Department of Health of the City of New York, in a report published in the *Weekly Bulletin* of the department, declares that the burning of gas in a room improves rather than vitiates the condition of the air. The products of the combustion, he states, are harmless, and the destruction by the flame of bacteria tends to purify the air. Also, the effect of gaslight on the eyes he finds less injurious than that of electricity.

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Were We Born That Way? is the title of an article in *World's Work* for October, by Prof. Lewis M. Terman of the University of California. The writer discusses the nature and significance of the late scientific views on intellectual variations and differences.

* * *

Katherine Fullerton Gerould has in *Harper's Magazine* for October a clever and interesting dissertation on the why and wherefore of the caveman and the cave in present day literature. She arrives at no definite conclusion, but her conjectures are entertaining. Treat 'Em Rough is the title of her discussion.

* * *

Prospects as to food and eating in the coming century are good, according to Dr. Charles H. La Wall, dean of the Philadelphia College of Pharmacy, writing in a recent number of the *American Journal of Pharmacy*. He predicts many and farreaching improvements in food preservation and handling, with never again an opportunity for the repetition of conditions during the war, when, it is reported, "one half of the fruit and vegetables in the United States never reached the consumer."

* * *

Surgeon Taliaferro Clark, of the United States Public Health Service, has an article in *Public Health Reports* for September 8th on the school nurse and her duties. Dr. Clark discusses these duties and their variations according to whether or not the school nurse works alone, with a full time school physician, or with a part time physician, and whether or not her work is in an urban or a rural school.

* * *

Pasteur's home city, Strasbourg, is planning a great celebration of the hundredth anniversary of his birth, which was on December 27, 1822. The city will dedicate a monument, built by popular subscription, in a public square; a permanent museum illustrating the various phases of his scientific work will be inaugurated; and an exposition will be held from June until October, 1923, near the gates of the city, which will demonstrate the practical results of Pasteur's discoveries in medicine, agriculture, manufacturing and hygiene. During this exposition, congresses on infant and child hygiene, tuberculosis, venereal diseases, cancer, hydrology, cold storage and animal husbandry will be held.

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Gentle Julia, by Booth Tarkington, is written in his usual pleasing style, and is commended to those interested in the mental life of the young for its psychological interest as well as for its ability to provide pleasant entertainment for an evening at home.

New Publications Received.

GARGOYLES. By BEN HECHT. New York: Boni & Liveright, 1922. Pp. 346.

PSYCHOANALYSIS AND LOVE. By ANDRÉ TRIDON. New York: Brentano's, 1922.

THE JUDGE. By REBECCA WEST. New York: George H. Doran Co., 1922. Pp. 491.

ATOLLS OF THE SUN. By FREDERICK O'BRIEN. New York: Century Co., 1922. Pp. 508.

THE MIRACLE. By E. TEMPLE THURSTON. New York: D. Appleton and Co. Pp. x-338.

RICKETS. By J. LAWSON DICK, M.D., Ed., F.R.C.S. New York: E. B. Treat & Co., 1922. Pp. xiii-488.

OUR UNCONSCIOUS MIND AND HOW TO USE IT. By FREDERICK PIERCE. New York: E. P. Dutton & Co., 1922. Pp. ix-323.

WHAT TO EAT AND HOW TO PREPARE IT. By ELIZABETH A. MONAGHAN. New York: George H. Doran Company, 1922. Pp. xii-185.

PROPEDEUTIQUE ET TECHNIQUE UROLOGIQUES. Avec 153 figures. Bruxelles: Goemaere; Paris: Masson & Cie, Editeurs, 1922. Pp. 483.

A MANUAL OF PHARMACOLOGY. By TORALD SOLLMAN, M.D. Second Edition. Philadelphia and London: W. B. Saunders Company. Pp. i-1066.

THE BREAKING POINT. By MARY ROBERTS RINEHART. Frontispiece by THOMAS FOGARTY. New York: George H. Doran Co., 1922. Pp. 356.

CLINICAL MEDICINE, I. By LEWELLYS F. BARKER, M.D., LL.D. Illustrated. Philadelphia and London: W. B. Saunders Co., 1922. Pp. vii-617.

UNTERSUCHUNGEN UBER DIE EIGENREFLEXE (SEHNENREFLEXE) MENSCHLICHER MUSKELN. Von PAUL HOFFMAN. Berlin: Verlag von Julius Springer, 1922. Pp. 106.

ANIMAL PARASITES AND HUMAN DISEASE. By ASA C. CHANDLER, M.S., Ph.D. Second Edition, revised. New York: John Wiley & Sons, Inc., 1922. London: Chapman & Hall, Limited.

INJURY, RECOVERY AND DEATH IN RELATION TO CONDUCTIVITY AND PERMEABILITY. By W. J. V. OSTERHOUT, Professor of Botany. Philadelphia and London: J. B. Lippincott Company. Pp. xx-259.

LATERAL CURVATURE OF THE SPINE AND ROUND SHOULDERS. By ROBERT W. LOVETT, M.D., Sc.D. Fourth Edition, revised. With 172 Illustrations. Philadelphia: P. Blakiston's Son & Co., 1922. Pp. 217.

IMPULS-HANDLUNGEN (Wandertrieb, Dipsomanie, Kleptomanie, Pyromanie, und Verwandte Zustande). Von Dr. WILHELM STEKEL, Nervenarzt in Wien. Mit four textabbildungen. Berlin und Wien: Urban & Schwarzenberg, 1922. Pp. ix-520.

Practical Therapeutics

CRUDE PETROLEUM IN TUBERCULOUS OSTEOMYELITIS AND PSOAS ABSCESS.

By W. Forest Dutton, M. D.,
Tulsa, Okla.

Petroleum has been used as a therapeutic agent in various diseases. It is used internally and externally. The dose and method of administration is governed by the therapeutic use of petroleum. It is the purpose of this paper to discuss an application of rock oil which is rarely referred to, if at all, in literature, i. e., in tuberculous osteomyelitis and psoas abscess. The petroleum used should be of high specific gravity, high in gasoline content, and free from asphalt. Pennsylvania, Ohio, West Virginia, and Oklahoma oils are preferable in the order named. My experience is gained by the treatment and observation of over a hundred cases. A few cases will be cited to elaborate upon the diseases and their treatment.

Case I.—A housewife of forty-four entered the Protestant Hospital, Columbus, Ohio, October, 1901. About three months before entrance the patient noticed a lump on the sternum near the fifth costal cartilage. After a few weeks it became much enlarged and painful. The patient was operated upon by Dr. William Means. An incision six inches in length was made and the bone thoroughly curretted. The patient was discharged in a week, but the wound continued to discharge profusely. Eight weeks later the patient reentered the hospital, and was operated upon again by Dr. Means. The entire sternum from the first rib was removed including the cartilages of the second, third, fourth, fifth, sixth and seventh ribs. A large space remained open. The wound healed slowly and a discharge continued to flow from the sinuses which extended to the ends of the ribs. During a period of six months every effort to heal these wounds failed. Having used crude oil (Ohio, 45 gravity) in healing other wounds, this was used. After cleansing the sinuses thoroughly, the oil was injected into each sinus twice daily. In six weeks the wounds had healed. The patient is now living at the age of sixty-five and has had no recurrence of the disease.

Case II.—A schoolboy of twelve came under my service in January, 1906. Previous history did not reveal anything of importance. Examination showed acute osteomyelitis of middle third of right tibia. The patient was removed to Mercy Hospital, Pittsburgh, Pa., and operated by Dr. Robert Stewart. A small pocket of pus about the size of a hazelnut was found in the medulla. Free drainage was established. The acute symptoms gradually subsided, but the sinus continued to discharge. A second operation was performed. The cavity of the bone was freely opened and the wound left open. After two months, the wound was discharging large amounts of pus. Various solutions were used without securing results. Instillation of petroleum (Pennsylvania crude, high gravity) was used twice daily. This gave excellent results. The wound healed rapidly and closed at the end of three weeks.

Case III.—A housewife of thirty-two came into my service, March, 1911. The family history was negative. The patient had influenza in 1910, and had not felt well since. She had lost weight, felt weak on exertion, and slight elevation of temperature in the afternoon. There was pain in the right side and pain radiating down the left thigh. Physical examination showed patient fairly well nourished. The heart was normal, pulse 76. The lungs showed involvement of upper left lobe. Examination of the abdomen revealed spindleshaped mass extending from lower pole of right kidney to the brim of the pelvis. It was rigid and otherwise misleading. The consultants suggested that it was possible sarcoma or retroperitoneal abscess. Physical examination was otherwise negative. The temperature was 99° F. The urine was negative, blood negative.

It was decided to operate. The operation revealed a large sausageshaped mass as above described. There was a great deal of glandular involvement. The operator had decided to close the wound when it was suggested that he pass a small trocar into the mass. This procedure revealed a large pocket of yellowish white pus. A stab puncture was made from the loin and drainage inserted. The abscess drained for eight weeks without apparent healing. Instillations of various solutions were used without result. At the end of the third month petroleum (Pennsylvania, high gravity) was used. The patient made a rapid uneventful recovery.

Crude petroleum has been used in various pathological conditions by physicians throughout the oil country since 1860. It has proved highly satisfactory when properly used.

The fact that petroleum is a common commercial product has, in a great measure, accounted for its deletion from the physicians' armamentarium. Clinical experience with crude petroleum has proven its therapeutic value. Its germicidal properties should be given more than passing attention. For this reason the clinical evidence is contributed for its intrinsic value.

603 New Wright Building.

Pituitrin in Obstetrics.—C. Hal Cleveland (*New Orleans Medical and Surgical Journal,* May, 1922) presents the following indications and contraindications for the use of pituitrin in obstetrics:

Indications.—1. Weak pains in the second stage of labor and occasionally near the end of the first stage if the cervix is dilatable; this is by far the most common indication. 2. In the second stage when the pains are weak and the patient is in twilight sleep or under an anesthetic. 3. In accidental hemorrhage—abruptio placentæ—when the head is engaged and the membranes have ruptured. 4. Having changed a face into an occipital presentation strong pains are needed to force the occiput down on the perineum. 5. In the third stage after the delivery of the placenta, to cause retraction and contraction of the atonic uterus. 6. In postpartum hemorrhage from atony. 7. In the puerperal stage where there are clots or pieces of placenta in utero. 8. In late puerperal hemorrhage. 9. In Cæsarean section, directly into the muscle if the uterus does not contract promptly. 10. To control bleeding following curettage after miscarriage. 11. Some good results have been reported in cases of metritis and endometritis resulting from puerperal infection.

Contraindications.—1. Contracted pelvis. 2. Malposition and malpresentation. 3. Tumors blocking the passage. 4. Diseased uterus, e. g., scars from previous section. 5. It should not be used early in labor when the cervix is closed or undilatable. 6. Cardiac disease with high blood pressure, since pituitrin causes an increase in systolic pressure. 7. Eclampsia, for practically all these patients have high blood pressure. 8. Threatened asphyxia of the child in utero. Where the infant is already advancing laboriously and is somewhat stunned by the hardships of the way, where the os is incompletely dilated or some obstacle to progress exists, the attempt to hasten delivery by the use of pituitrin may bring on tetanic contractions of the uterus and close the placental circulation and thus asphyxiate the child. Pituitrin should never be used without first listening to the fetal heart sounds; the danger signs are very slow, very fast, or irregular heart beats.

Among the bad results from the careless use of pituitrin may be mentioned: 1. Perineal tears—and they are more common than most of us like to admit. 2. Lacerated cervices—many a cervix has been torn by too early administration of pituitrin. 3. Pressure necrosis of the soft parts—this does not often happen. 4. Rupture of the uterus—a review of the literature on this subject reveals a number of these cases. 5. Asphyxiation of the child by too prolonged uterine contractions—this accounts for a certain percentage of the infant mortality. 6. Cerebral hemorrhage or other cerebral disease.

Proteotherapy and Vaccine Treatment.—Bruno Bussom (*Wiener klinische Wochenschrift,* May 18, 1922) states that all protein substances, especially decomposition products, are toxins to parenchymatous tissues and frequently have a marked effect on vascular capillaries, similar to the albuminous split products of the ergot of rye and certain proteinogen amines, histones and protamines, and especially the pairlings of the albuminous bodies rich in diaminoacid. It is immaterial whether the split products are introduced in the form of albumin or whether they arise in the body itself from decomposition as in infectious diseases, röntgen ray and radium irradiation and injection of colloids or other organotropic substances, as they all act as stimulants to the tissue cells. This stimulation may have a functional, nutritive, formative, inflammatory, or vasomotor effect on the healthy cell, but particularly on such tissue as is in a condition of changed irritability, as in acute or chronic inflammatory foci. Weak stimulation increases the vital activity, medium stimulation promotes it, marked stimulation inhibits it and the strongest prevents it. Therefore, therapeutic success is possible only when the strength of the stimulation is properly selected and when the diseased organism is capable of reaction to the stimulation; the one and the same dose may be the proper one, or insufficient, or excessive, according to the nature of the disease and the condition of stimulation in the cells. As a rule, larger doses are required in acutely inflamed foci.

Proteotherapy is indicated where the insufficient organism requires a stimulation to increased activity, to restoration of the metabolism, to blood formation, or where the preparation for resistance is generally or only locally insufficient. For this purpose protein bodies in the form of vaccines, blood and sera, albuminous preparations, also colloids like collargol, electroferrol, gelatin, argoflavin, or organotropic substances like x ray and radium irradiations, and crystalloid substances like arsenic, phosphorus and formic acid may be used. The most popular are various vaccines, also casein, milk and serum injections. Nothing more than theories are known regarding the rationale of this form of treatment. In contrast to true immunization, proteotherapy achieves only momentary results.

Vaccine treatment, in the sense of the development of a specific immunity, always requires repeated injections and long periods of time. It is especially indicated in localized processes, encapsulated foci, occult abscesses and particularly in diseases of the skin and mucous membranes. The antibodies produced by vaccine therapy reach the focus by way of the circulation and there exert their healing effect. Autovaccine therapy is much more effective than vaccine therapy. The former is strictly specific. Albumin therapy, protoplasm activation and stimulation therapy, on the other hand, lead to a rapid, often instantaneous effect, of short duration.

Treatment of Vomiting of Pregnancy by Means of Adrenalin.—F. N. Blasco (*Medicina Ibera*) says that in 1908 Silvestri traced a connection between Addison's disease and the incoercible vomiting of pregnancy. On administering adrenal extract he was gratified to see the vomiting cease after a few days, and many others since then have reported equally favorable results. Sergent and Lian, who are enthusiastic advocates of this treatment, do not hesitate to champion *a priori* the theory that incoercible vomiting results from autotoxemia. They believe this toxemia often coexists with adrenal insufficiency and are inclined to the view that the latter is due to the former. In a series of examinations of the glands of women, dogs, and guinea pigs they have seen the cortex undergo important cytological modifications coincident with hyperfunction of the organ. These alterations point to adrenal secretion as a defensive mechanism in pregnant women for neutralizing the autointoxication incident to their condition. Vomiting therefore is an evidence of adrenal insufficiency. Injection of adrenalin, Blasco says, has the double effect of stimulating on the one hand the sympathetic system and the contractions of the gastrointestinal tube, and on the other of inciting the adrenal cortex to secrete an increased amount of cholesterin, which, by its antitoxic effect, neutralizes the gravidic toxins responsible for the vomiting. Whatever the truth of this theory, the treatment has proved effective in a multitude of cases. With some, the administration requires to be continued for ten or twelve days. Subcutaneous administration of a few minims at a time is preferable to larger doses, but the effective dose varies with the severity of the vomiting.

Proceedings of Societies

AMERICAN PEDIATRIC SOCIETY.

Thirty-fourth Annual Meeting, Held in Washington, D. C., May 1, 2 and 3, 1922.

The President, Dr. Maynard Ladd, of Boston, in the Chair.

(*Continued from page* 239)

A Clinical and Pathological Study of Brain Tumors in Young Children.—Dr. Frederic H. Bartlett and Dr. Martha Wollstein, of New York, stated that among 4,563 autopsy records at the Babies' Hospital, there were nine cases of neoplasm of the brain. This was an incidence of 0.2 of one per cent. which was rather less than the one per cent. recorded for the occurrence of brain tumors among adults. Of these cases seven were boys and two were girls. A detailed study of seven cases was presented. Of these five of the neoplasms were located in the cerebellum and two in the cerebrum. All five infratentorial tumors involved the vermis and extended into one lobe of the cerebellum, compressing the other lobe; all had distorted the medulla; three had compressed the upper cervical segment of the spinal cord; one had compressed the pons as well as the medulla; one had extended into the pons and was accompanied by a cyst in the fourth ventricle, and another involved one of the cerebellar pontine peduncles. None gave rise to metastases in other organs. The tumors were all large, situated under the pia, and were very vascular, containing small hemorrhages and areas of necrosis. Hydrocephalus was present in all five tumors. Histologically all five infratentorial neoplasms were gliomata of the astrocytoma type. The two supratentorial tumors were dissimilar in location and in structure. In one case the tumor involved the corpora striata, optic thalami and the corpora quadrigemina. Histologically this tumor was a glioma. In the second supratentorial case, the tumor was a gliosarcoma. Only one of these children presented a malformation in any other organ than the brain. In this instance a boy whose glioma involved the basal ganglia had a horseshoe kidney. The average age of the children reported in this series was about fifteen months.

When brain tumors reached a size to give physical signs the symptoms were comparable with those in adults, namely, spasticities, increased reflexes, and local paralysis. An interesting point in connection with this series of cases was in reference to two symptoms, vomiting and convulsions, commonly associated with brain tumors. Vomiting occurred in three of the seven cases as an early symptom; convulsions occurred in only one instance and then as a terminal phenomenon a few hours before death. Infrequency of vomiting and convulsions in this series might possibly be explained by the gradual increase in intracranial pressure and by the extreme adaptability of the young brain tissue to pressure gradually applied. The spinal fluids obtained on lumbar puncture in these seven cases varied in amount from five to thirty c. c. The pressure was increased only when the cases were seen early; later in the disease the pressure was not increased. The fluid was clear and colorless except in one case, in which both the cells and globulin were increased in amount. The fluid in this case was blood tinged at autopsy, which was explained by the comparatively large amount of hemorrhage and necrosis in the tumor. The presence of blood would explain the increased number of cells and the increased globulin in this case.

Dr. Charles Hunter Dunn, of Boston, said that he had had four or five cases of brain tumor come to autopsy at the Children's Hospital. All were very much like the cases which Dr. Bartlett had reported. Four of the tumors were cerebellar and two originated in the basal ganglia. None of the children showed convulsions. The most of these cases that originated in the cerebellum or basal ganglia did not show convulsions. Dr. Dunn stated that he had seen but one successful operation for brain tumor in a young child and in that case the tumor was cortical in origin and convulsions were the first symptom. It was only in cortical tumors that convulsions were an early symptom.

Aplastic Anemia.—Dr. Charles Herrman, of New York, reported a case of aplastic anemia in a child four years old, which was markedly improved by transfusion. At the time of admission to the hospital on November 4, 1921, the child gave a history of fever and pain in the abdomen for two weeks. Examination showed asthenia, marked pallor, puffiness of the face, and ecchymotic spots on the left calf. The temperature was 101°; pulse 150, and respiration 30. The blood examination showed red blood cells, 750,000; hemoglobin, twenty-five per cent.; white blood cells, 2,500; polynuclears, twenty-five per cent.; lymphocytes, seventy-five per cent. A transfusion of 380 c. c. of whole blood was given, which was followed by gradual and progressive improvement. Two days after the transfusion the blood count showed red blood cells, 2,330,000; hemoglobin, forty-five per cent.; white blood cells, 2,400; polynuclears, twenty-two per cent.; lymphocytes, sixty-eight per cent.; moderate polychromatophilia, poikilocytosis, and macrocytes. The platelets numbered 170,000. There were no normoblasts or myelocytes. The patient was discharged from the hospital December 13, 1921. She was readmitted on March 26th, and discharged on April 22d. She died on April 25th. No autopsy was permitted.

About sixty cases of this condition had been recorded in the literature, of which twenty-one occurred in children. An analysis of these cases was presented. Dr. Herrman felt that there was no doubt that with more careful observation and hematological study the disease would be found to be less rare than the number of reported cases would seem to indicate. Among adults about an equal number of cases occurred in both sexes; in children, however, about twice as many cases occurred in males as in females. The most generally accepted explanation of the condition was that it was a primary lesion of the bone marrow due to the action upon it of some unknown toxic material. This resulted in a deficient production of blood cells, red cells, polymorphonuclear leucocytes, platelets and myelocytes. There was no definite evidence that the reduction in the number of red cells was due to increased destruction. The skin, mucous membrane, liver and spleen showed characteristic changes and pathognomonic changes were shown in the bone marrow. The bone marrow was largely replaced by fat and connective tissue, which gave it a yellow color and a peculiar consistency. The disease manifested itself by anemia, shortness of breath and general weakness. The skin and conjunctivæ were not yellow; the former was grayish white and the latter had a bluish tinge. A puffiness of the face, more particularly of the eyelids, was frequently noted. There was a distinct hemorrhagic tendency, as shown by petechial spots on the skin, and in many cases hemorrhages from various mucous membranes.

The disease from which it was most important and difficult to differentiate aplastic anemia was pernicious anemia. A table which was of aid in making this differentiation was included. In aplastic anemia there was aplasia, or at least a hypoplasia of the bone marrow, a deficient production of new cells, but no evidence of increased destruction. In pernicious anemia there was a marked deposit of hemosiderin in the liver and the body fat was canary yellow, which was not the case in the aplastic form of anemia. Most authors considered the disease to be invariably fatal. In the treatment preparations of iron, so valuable in other forms of anemia, were of little value. A few patients had been somewhat helped by injections of arsenic. Preparations of bone marrow had been given without favorable effect. Radiation of the bone with the röntgen rays might be injurious rather than beneficial. The best method of treatment available at the present time was the transfusion of whole blood; from three to five hundred c. c. were usually given, and repeated if necessary. If after temporary improvement the blood tended to return to its previous condition, the prognosis was unfavorable; on the other hand, if there was a slight progressive increase in the percentage of hemoglobin, in the number of red blood cells, in the polymorphonuclear leucocytes and in the platelets, the prognosis was not so unfavorable. Splenectomy had been performed in one or two cases with unfavorable result, and appeared to be contraindicated.

Lucilia, the Ubiquitous Paralysis Fly, and Its Ally, the Buzzard.—Dr. E. W. Saunders, of St. Louis, stated that there was abundant proof from several scientific sources that Lucilia was the obligate host of a botulinoid organism, a toxivirus which paralyzed and killed any vertebrate so far experimented upon, to wit, any species of bird, quadruped or reptile (both venomous and nonvenomous). The lucilia epizootic was primarily an avian disease. Poultry required very large lethal doses, and might recover either completely or partially with residual paralysis after large doses of toxivirulent larvæ. On the other hand, guineapigs never recovered from the smallest toxic doses. Dr. Saunders raised the query whether it was incumbent upon the advocates of Lucilia causation of human poliomyelitis to prove that man who was admittedly accessible to Lucilia was susceptible to its toxivirus, or whether it was obligatory upon despisers of Lucilia's claims to prove that man alone of all vertebrates was unsusceptible. The universal distribution of Lucilia from the equator to the poles; its extreme hardihood; its activity in human and animal habitations when the thermometer without was 40° below zero; its habit of depositing its paralysant ova indifferently upon animal or vegetable matter, either fresh or in a state of putrescence, in this particular differing from other carrion flies, all incriminated this insect. This species of fly has an eradicably wild nature and refused to propagate in captivity. The buzzard, the sacred bird of America, was protected by law in every state, in spite of the fact that it had been proven guilty of carrying disease germs over whole continents. To its activity was due the destruction of all the cattle among the Barotse tribes of Central Africa by rinderpest, and the extermination of the water buffalo in the Philippines. It conveyed cholera germs all over India, until the government abolished the Towers of Silence where the Parsees deposited their cholera dead, to be devoured by the birds. It had carried the various cattle diseases over all the states of the Union. There was necessity for immediate destruction of this bird of evil omen by the Federal Government.

Convulsions and Petit Mal Due to Genital Irritation.—Dr. Henry T. Machell, of Toronto, Canada, reported a case of convulsions and mild or pseudopetit mal, due to genital irritation, occurring in a boy. When first seen on July 10th, he had had five convulsions, scarcely regaining consciousness between the attacks. No diagnosis was made at the time. About the first of September he began to have petit mal attacks which increased in number and severity as the months went on until he was having ten to two dozen a day, falling and bruising his forehead and face repeatedly. On February 15, 1922, he had screaming spells, grasping his genitals every time he urinated. Investigation showed irritation under the foreskin, the cause of which was removed. The child had no more crying or screaming spells or petit mal attacks for several weeks and it was thought that the cause of the attacks had been removed. On April 7th, Dr. Machell was again asked to see the boy who had been having from two to fifteen falling attacks daily for about three weeks, though milder in character than those of two months before. It would seem that the theory that the attacks were due to genital or intestinal irritation must be abandoned and that one would have to fall back on the petit mal theory as the cause of the attacks.

Xanthoma Tuberosum with Diabetes Insipidus.—Dr. J. P. Crozer Griffith, of Philadelphia, stated that in this case, the patient, a boy nine years of age, came to the Children's Ward of the Hospital of the University of Pennsylvania on September 21, 1921, on account of yellowness and swelling of the abdomen. Enlargement of the abdomen was noted when the boy was three years of age, but was temporary. Except for poor nutrition the boy was in apparently good health until January, 1919, when he had an attack of jaundice from which he recovered in two or three weeks. A year later a fall on the head was followed by a lump which disappeared, but another soon developed which was excised and the bone scraped. In October, 1920, injections of mercuric chloride were started on the ground of possible syphilis. A few days later icterus developed, the abdomen became enlarged and also the liver; debility and emaciation came on, and these symptoms had continued. At the same time small nodules appeared on the skin of the palms and neck, and these spread more or less over the body. The blood pressure was particularly low—78 systolic and 58 diastolic. The amount of urine varied from five thousand to eight thousand c. c. daily. Under the administration of sodium chloride it rose to ten thousand. The specific gravity was always low, usually below 1.007. Pituitary extract given by the mouth had no effect, but the obstetrical preparation of pituitrin hypodermically, one c. c. daily, reduced the amount of urine to normal, but did not affect its specific gravity. The basal metabolism showed nothing abnormal. The blood examination revealed an increased leucocytosis; an increased resistance to hypotonic salt solution; the blood sugar was 0.06 per cent.; blood cholesterol 397 mgm. to 100 c. c. The Wassermann reaction was negative. The feces contained an excess of fat but no bile pigment. The phenolsulphonephthalein test of the urinary function gave an excretion of twenty-five per cent. during the first hour and ten per cent. more during the second hour. The child was in the hospital for two months and left with little change in his condition. The case was of interest because of the uncommonness of xanthoma tuberosum, this being in all probability the second case on record in this country; the extreme rarity of jaundice as a symptom in childhood; the remarkable combination of xanthoma tuberosum and diabetes insipidus; the confirmation by the saline test of the opinion that in diabetes insipidus there was an inability of the kidneys to concentrate urine; pituitrin, although diminishing the urine, did not increase the specific gravity.

Peculiar Case of Purulent Meningitis in the Newborn.—Dr. T. De Witt Sherman, of Buffalo, N. Y., reported this case, because of the fact that the exciting agent belonged to the group of Bacillus lactis aerogenes, and that the bacillus isolated could not be identified with any known pathogenic organism. The intestinal origin of the infection was corroborated by the changes found in the liver. The bacillus isolated was found to be pathogenic for mice, causing death in twelve hours or thereabouts, and in these mice it also produced a distinct inflammation of the cranial meninges. The patient was an infant, apparently normal until three days old, except that it did not breathe promptly after birth. The onset of the condition was marked by convulsions and symptoms resembling those of tetany. On the sixth day Cheyre-Stokes respiration and cyanosis developed and the baby died on the seventh day. The autopsy showed a hemorrhagic, suppurative leptomeningitis of the left convex surface and of part of the base of the brain and also of the spinal cord. In addition there was an acute catarrhal gastroenteritis, acute hepatitis, degeneration of the heart and kidneys and acute swelling of the spleen.

(*To be concluded*)

Letters to the Editor.

PERIODICAL PHYSICAL EXAMINATIONS.

Albany, *October 21, 1922.*

To the Editor:

At the Annual Conference of Health Officers and Public Health Nurses of New York State, held in Saratoga Springs last June, I referred to the importance of periodical physical examinations, which I have long advocated as a means for the preservation of health and the prevention of diseases through early recognition and the correction of defects and abnormal conditions. Comments which have since appeared in a number of newspapers indicate that serious misconception exists in some minds as to the purport of my remarks. The impression seems to have arisen that I favor an official scheme of compulsory physical examinations, to be conducted by health officers or other physicians employed by the public authorities, with the implication that every man, woman and child should be required to submit to such a periodical inquest into his or her physical condition.

It does not seem really necessary to explain that I agree heartily with the critics of any such proposal, and that I never have and do not advocate any kind of compulsory State medical inspection of the individual citizen, except as such inspection is now carried on practically everywhere in our public schools and in charitable and penal institutions. A prying inquest by public authority into the physical condition of the adult citizen would be utterly repugnant to American ideas of individual rights, and of the proper sphere of government. The worst enemy of periodical medical examinations could choose no better means of making his opposition effective than to advocate such a fantastic plan as seems to have been read into my address at Saratoga.

So much having been made clear, I ask space to repeat my conviction that nothing is more important for the citizen who cares to keep well than that he should go of his own free will to his own physician and demand thorough examination at reasonable intervals, with the application of all the resources of modern scientific medical knowledge. This means not merely a hasty examination of the heart and lungs with the stethoscope, but a complete medical survey, including various special tests of the blood and excretions, examination of the eyesight and hearing, as well as of the nose and throat, and often accompanied by an x ray of the chest or other parts of the body. Adequate examination also means taking into account mental as well as physical factors, and basing conclusions on a full knowledge of living and working conditions, income, habits, recreations, and the pertinent facts of family and personal history.

It must be obvious that such examination and advice based on it can be properly made and given only under the conditions of freedom and intimacy which are implied in the relation of the individual to his family physician. For the State to attempt thus to examine its citizens would be not only intolerable but futile, since the utmost degree of confidence and cooperation on the part of the patient is required if anything is to be accomplished. The best trained modern physicians are equipped to examine and advise their clients how to keep well, and rightly expect to be consulted for this purpose and not merely to attempt the cure of an established disease. Perhaps it is not true that the Chinese pay their doctors only to keep them well, but if this popular legend is not based on fact it was at least well invented, for it expresses the essence of the coming system and practice of civilized society. As was said recently in one of our radio health talks, "The human body is the only machine for which there are no spare parts." We must learn rightly to use and carefully to safeguard those which we have. And we can best do this by picking out a competent medical adviser, consulting him frequently, believing what he says, and following his counsel. If we do this as free individuals the health of the State will largely take care of itself.

Hermann M. Biggs, M. D.,
State Commissioner of Health.

DERIVATION OF THE WORD SYPHILIS.

Toronto, *August 14 1922.*

To the Editor:

In my article in the New York Medical Journal for May 4, 1921, on The Origin of the Word Syphilis, there was a statement, first made by Dr. Franz Boll, of Heidelberg, in the *Neu Jahrbuecher fuer das Klassiche Alterthum Geschichte* for 1910, that the name *Syphilus* given by Fracastoro in his *Sypihilidis sive Morbi Gallici libri tres,* 1530, to the impious shepherd whose blasphemy brought the plague of syphilis upon the people of Ophire and after whom the disease was named, was derived from *Sipylus,* the mountain on the frontiers of Lydia and Phrygia upon which Niobe, turned to stone, "ever sits weeping and to this day the rock flows down in tears." Dr. Boll pointed out that in some manuscripts the name of the mountain (and of Niobe's second son named after it) is written *Siphylus.*

While this derivation seemed almost certain, I have examined all the extant writings of Fracastoro to see if any further light could be obtained—my copy of his complete works is of the Geneva edition of 1637, Hypis Iacobi Stoer and of the *Syphilidis* alone, I have two copies printed in Paris, 1796, slightly differing. What seem to be the only weak points in the derivation suggested, are the absence of any apparent reason for selecting this obscure mountain instead of one better known; and the vowel of the first syllable. But this mountain in this orthography is expressly named and taken as a representative of its class in another of Fracastoro's poems, *Ad Ioann. Baptistam Turrianum Veronensem.* This is a dactylic hexameter carmen or rather dirge, in which the poet laments the death of his sons, Paulus and Julius . . .

> . . . primas alter vix fingere voces.
> Alter adhuc teneris jam tum decerpere ab annis
> Prima audimmenta atque omen praebere parenti," vv. 10-12.

He consoles himself with the thought that all things change—the vast ocean will see its end, the ploughshare will break the sod where now the sharp keels furrow the blue waters, the flowing rivers will become dry, whether Father Eridanus (the Po) with his mighty flood, or the swollen Ister (the Danube) with his many mouths. He continues: (vv. 99-102)

> Quin etiam aerii montes, mirabile dictu,
> Taygetus, Syphilusque ingo et Cymbotus opaco
> Innumeras post aestates, ac saecula longa
> Senserunt seniumque, supremaque fata—

* * *

> Nay, marvellous to relate, the lofty mountains,
> Taygetus, Syphilus with its dark top and cymbotus
> after countless summers and long ages, will experience decay and their final doom.

The selection of Syphilus on a typical mountain shows the view held by Fracastoro of its importance: he placed it among the mountains in the same rank as the Danube among rivers—and the orthography is that of the longer poem, *Syphilidis sive Morbi Gallici.* Boll's theory is thus distinctly strengthened. The argument from the quantity of the first syllable of the word *Syphilus* is, indeed, weakened—in the carmen it is short. In the longer poem, the word, or its derivative syphilis occurs only five times—Lib III vv. 288, 329, 332, 364, 371.

288—Syphilus (ut fama est) ipsa haec ad flumina pastor—
(The Shepherd Syphilus, as the story goes, by these very waters)
329—Syphylus ostendit turpes per corpus achores—
(Syphylus shows foul achores throughout the body.)
(The name is here spelled Syphylus not Syphilus in all the three editions I have at hand.)
332—Syphilidemque ab eo labem dixere coloni—
(And from him the country called the infection, Syphilis.)
364—Syphilus . . . . —
(The single victim selected by lot for sacrifice yearly at the altar of the Sun is called) Syphilus.
371— . . . . . ille tuum testatur, Syphile, crimen—
(The victim sacrificed each year to the Sun), himself bears witness to your sin, Syphilus.

It will be seen that in every case the first syllable is long as is that of *Sipylus* or *siphylus* in Ovid; whatever may be the explanation of the quantity in the carmen—perhaps the exigency of metre—in the longer poem, the first syllable is consistently long. In every case but one as it begins the verse, it must be long. This difference, although not unimportant in the case of a superb Latinist like Fracastoro, must yield in significance to the consideration above mentioned.

William Renwick Riddell.

TREATMENT OF BURNS.

Randolph, N. Y., *October 10, 1922.*

To the Editor:

I endorse and emphasize the technic of Dr. Steel as described in the New York Medical Journal of October 4, 1922. For over forty years I have treated burns with mineral oil, even in the days before the refined product of crude oil was on the market. I found that the crude black petroleum was a soothing application for burns.

Since the refined mineral oil has been obtainable it has been my custom to use it in the treatment of burns, along the same practical lines suggested by Dr. Steel. But his device for protecting the patient with cradle and sheet and his addition of electric lights make a most desirable addition to the treatment I have used.

If Dr. Steel's technic is carried out as directed, better results will be obtained in the treatment of this most painful and often destructive injury. I am therefore pleased to give it my most emphatic endorsement.

Edward Wallace Lee, M. D.

Abstracts from Current Literature

DIABETES.

Modern Aspects of Diabetes.—K. A. Heiberg (*Münchener medizinische Wochenschrift,* May 19, 1922) says that the immediately apparent severity of diabetes is not proportional to the tendency of the progression of the disease. If a diabetic is placed upon a high level of diet, a breakdown may readily follow. It is more advisable to place the patient on a more restricted diet as has been done heretofore. In those cases of diabetes that are not attributable to a chronic pancreatitis (as is the case with most of the youthful diabetics), the reduction of the power of resistance and tolerance play an important part in the development of the disease as a result of very harmful noxa (as slight infections), possibly latent noxa in the glandular system or elsewhere and transgressions of tolerance. Clinical observation shows more clearly and unequivocally than animal experiments that a diet excessive in calories produces a severe aggravation of the diabetic metabolic disturbance. The starvation days have been proved to be exceedingly valuable in the dietetic therapy, as the amount of the food can be reduced considerably more and for a longer time than is usually done now owing to the ungrounded fear of possible injuries.

Divided Meals for Severe Diabetes.—H. Gray (*Boston Medical and Surgical Journal,* June 8, 1922) suggests that a diabetic's ability to metabolize food may be stimulated by small meals, frequently given, in much the same way that immunity is produced. The theory of divided meals appears to be activation of the liver or pancreas by a small preliminary meal of carbohydrate given an hour or two before each main meal; the organism being then in action at the time of the regular meal responds to the food load more vigorously than with the every day three meal schedule. Two cases thus treated are reported, and the results seem to indicate that the method does help to lower the blood sugar. Another paper on the same subject, by T. Murayama, portrays the advantages of multiple meals in the treatment of severe cases of this disease.

Studies of the Metabolism of Diabetes.—Russell M. Wilder, Walter M. Boothby, and Carol Beeler (*Journal of Biological Chemistry,* April, 1922) report a metabolic study of a patient with diabetes mellitus, who had been under observation in the Mayo Clinic for a year. The studies bear on the effect of high protein and high fat dietaries, as well as other phases of diabetic metabolism, especially the basal metabolic rate and the respiratory quotient. The results of this long observation period are given as follows: The basal respiratory quotients averaged 0.693, the highest quotient being 0.74, and the lowest 0.65. Nine experiments on the immediate effect of food on the metabolic rate and respiratory quotient are described. An unexplained depression of the quotients was observed to follow the ingestion of food, being most marked after large amounts of protein. The postabsorptive or basal metabolic level of the diabetic patient is materially affected by the previous diet. In the undernourished patient it may be as low as 23 per cent. below the Du Bois normal standards. The ingestion of food containing one gm. of protein for each kilo of body weight with fat and carbohydrate in such an amount that the daily maintenance energy requirements of the patient were exceeded, caused an elevation of the basal level. while the ingestion of three gm. of protein for each kilo of body weight each day caused a greater rise in the basal metabolic rate than occurred with isocaloric amounts of other foods. In diabetes occurring in well nourished patients, the basal metabolic rate did not exceed the normal limits of the Du Bois's standards, unless the patient is on a high protein diet (or high caloric diet) or has some complicating condition such as an infection or hyperthyroidism. In patients distinctly under weight and who have not been receiving a diet high in protein (or calories) the basal metabolic rate is below the normal limits of Du Bois's standards. The critical or fatal D:N ratio of 3.65 has the prognostic significance in diabetes originally attributed to it by Lusk, provided the diabetes is uncomplicated. The sugar tolerance of the diabetic patient is depressed by high calorie, luxus diets, but much more markedly depressed by protein than by isocaloric amounts of fat. Throughout the experiments the glucose tolerance varied inversely with the basal metabolic level, rising as the rate fell and *vice versa.* Diets high in fat but low in protein and planned so that they contained nearly two gm. molecules of fatty acid to one of glucose, on two occasions, checked a dangerous and rising acidosis. It is suggested that the proportion of fatty acid which will completely burn with a limited amount of metabolizing glucose is not the same at all metabolic levels but may be increased by measures designed to depress the basal metabolic rate.

Familial Hemochromatosis (Bronze Diabetes).—A. V. Frisch (*Wiener Archiv für Innere Medizin,* April 5, 1922) reports a case with typical discoloration of the skin, marked indurative swelling and cirrhosis of the liver, the picture of a severe diabetic coma together with the symptoms of pancreatic insufficiency and also unexplainable nervous symptoms (vesical and rectal) not only during the coma but also at the beginning of the disease, considered as a diabetic pseudotabes. The patient's eight brothers and sisters and his mother were also supposed to have melanodermia, and enlargement (cirrhosis) of the liver and spleen were found in two of his brothers. If this case is considered as a familial (congenital) hemochromatosis with diabetes, caused by hypofunction of the reticuloendothelial cell apparatus toward the iron molecule. a certain parallelism, on the one hand, with Gaucher's splenomegaly is demonstrable in that the cells have lost their ability to eliminate absorbed lipoids adequately, and on the other hand, that Gaucher's disease is a pronounced familial disease. The hypofunction of the reticuloendothelial cell apparatus in hemochromatosis may be contrasted with hemolytic icterus insofar as this may be traced to an increased activity of the cells destined for the decomposition of hematin.

Prognosis in Diabetes Mellitus.—D. Murray Lyon (*Lancet,* May 27, 1922) states that before treatment for diabetes is begun, a valuable index of the severity of the disease is the degree and rapidity of the body wasting. Practically, the best guide to the gravity of the condition is the total amount of glucose lost each day in the urine, but this sign fails to distinguish between temporary and permanent damage. A degree of hyperglycemia may still be present, even when sugar no longer appears in the urine. No definite prognosis should be given until the character of the patient's response to treatment has been studied, as mere estimations of the gravity of the disease, when the patient is first seen, give no sure guide to the future, since some cases, apparently severe, do much better than others whose signs are less marked. The prognosis depends, to a great extent, upon the intelligence and reliability of the patient. His disease should be thoroughly explained to him, and also the proper diet. Regular weighing once a week is necessary and the weight should be kept near the normal. He should be taught the technic of the Fehling sugar test and he should examine his urine daily. The diet should be so regulated that glycosuria does not occur. Intercurrent diseases should be avoided, especially infectious diseases. Mental excitement of all kinds must also be avoided.

Etiology and Treatment of Diabetes.—With the aid of special methods and media, Arnold Renshaw (*British Medical Journal,* April 29, 1922) was enabled to isolate a new organism, namely the Bacillus amyloclasticus intestinalis, from the stools of diabetics. It splits up starchy foods, forming oxybutyric acid, diacetic acid, butyl alcohol, acetone and sugar. The amount of acetone in the stools is great enough to be estimated. In diabetes carbohydrate fermentation occurs in the alimentary canal with the liberation of abnormal products which affect the glycogenic function of the liver, leading to an improper storage there of the glucose from the alimentary canal. The treatment suggested is the utilization of the inhibitory effects of certain bacteria, such as the Bacillus volutans or the Bacillus acidi lactici, a diet which allows digestion and absorption by the patient of foods which the bacteria cannot assimilate, together with certain antiseptics of the coaltar dye groups.

Water and Salt Metabolism in Diabetes Mellitus.—J. Koopman (*Endocrinology,* January, 1922) says that the question whether a relation exists between diabetes insipidus and diabetes mellitus is one of great interest. At the present day diabetes insipidus is not attributed, as formerly, to pituitary lesion directly, but to disturbance of the centre for water metabolism near the tuber cinereum. The centre for sugar metabolism is seemingly situated in close proximity. Certainly a relation between the two functions in health and disease is not a priori absurd. From three observations of water and salt metabolism in diabetes mellitus the author's conclusion is that there are cases of this disease with polyuria in which the water and salt metabolism closely resembles that in the hyperchloremic form of diabetes insipidus. It is not yet certain whether there are cases resembling the hypochloremic form of diabetes insipidus.

Use of Pituitary Extracts by Mouth in Treatment of Diabetes Insipidus.—M. H. Rees and W. H. Olmsted (*Endocrinology,* March, 1922) report the case of a man, thirty-seven years old, who had been troubled for two years with diabetes insipidus to such an extent that he passed as much as twenty litres of urine in twenty-four hours. Salol coated capsules of posterior pituitary extract were found to control the thirst and polyuria as satisfactorily as did hypodermic injection of the fluid extract, provided only that a bedtime dose was included in the daily schedule.

Blood Pressure Studies in One Hundred and Forty Cases of Diabetes Mellitus.—Jacob Rosenbloom (*Journal of Laboratory and Clinical Medicine,* April, 1922) found that the blood pressure in his series of 140 cases of diabetes mellitus was normal or slightly under normal, when the diabetes was uncomplicated. In every case where there was a high blood pressure, there was also nephritis, arteriosclerosis, or aortitis. Twenty-two cases, or sixteen per cent. of the series, were complicated by hypertension. There was no effect noted on the blood pressure by the presence or absence of sugar in the urine.

Observations on Blood Fat in Diabetes.—N. R. Blatherwick (*Journal of Biological Chemistry,* November, 1921) studied the behavior of blood fat and blood sugar of diabetic patients living on diets similar to those recommended by Newburgh and Marsh, that is, a low protein, low carbohydrate and high fat diet. This study of blood fat in relation to the fat in the diet shows that cases of mild and moderate diabetes are apparently able to utilize satisfactorily large amounts of fat, as indicated by constancy of the blood fat level and by the absence of acetone bodies in the urine. It remains to be learned whether or not such high fat diets continued for a considerable period will prove to be an overstrain on the fat burning mechanism.

Thyroid Diabetes.—R. Grau San Martin (*Cronica Medico-Quirurgica de la Habaña,* March 1922) has observed two classes of diabetics with impaired thyroids, those whose diabetes antedated the manifestations of hyperthyroidism, and those in whom the signs of Basedow's disease appeared before those of diabetes. Of the latter group he relates three cases, the first one of especial interest. The patient was a woman of twenty-nine whose mother was also a sufferer from hyperthyroidism. Menstruation began at thirteen, was very irregular and painful, and ceased totally at eighteen. She was short and slight, weighing about ninety pounds; never more than a hundred. Four years before consulting the author diabetes had been discovered from examination of her urine. She had responded well to the Allen treatment and was free from glucose, acetone, and diacetic acid. Her goitrous symptoms consisted of enlarged thyroid, exophthalmos, tachycardiac arrhythmia, spells of suffocation, gastric crises of the hyperchlorhydric type, and great nervous instability. Her carbohydrate tolerance was very low. The complaint for which she sought relief was pain of intense severity in the right iliac fossa. Operation was decided on and performed in spite of the complications, a sclerotic right ovary being removed. Her genital organs were found in a decidedly rudimentary condition. contrasting strongly with the thyroid hyperfunction. Except for marked delirium during the first few days, she recovered excellently from the operation, and no return of the diabetic condition followed it.

SURGERY.

Three Years of Pelvic Surgery.—W. E. Fothergill (*British Medical Journal*, May 27, 1922) analyzed a series of 1354 consecutive operative cases, showing the relative frequency of common pelvic lesions and the results with surgical methods. In a series of eighty-two cases of pelvic infection, the mortality was nil and there were no unpleasant sequelæ, which is due to two factors: the natural tendency to recovery and the opening of the abdomen only after the subsidence of the acute inflammation, the vaginal route being chosen for drainage during the continuance of constitutional disturbances. The uterus and adnexa were removed in thirty-five out of seventy-seven cases because an isolated uterus is of no use and often is a source of trouble. Everything except the cervix should be removed unless it is possible to leave a fairly sound, working set of reproductive organs—uterus, tube and ovary.

Among pelvic growths, two hundred cases of so-called fibroids were the leading feature; one was a sarcoma and one an adenomyoma; cancer of the cervix complicated one case and cancer of the body of the uterus another; thirteen cases showed small ovarian cysts. There were nine cervical myomas, many were degenerated and several were infected, one showing general peritonitis on admission; one sloughing myoma was removed piecemeal through the vagina and laparotomy was done 199 times. Panhysterectomy was done ten times, supravaginal hysterectomy 180 times and myomectomy seven times; in two cases the growth was not removable. There were six deaths. Panhysterectomy was done only when the myoma was cervical and in the cancerous complications. In operations for myoma, nothing but the cervix was left, unless a working set of reproductive organs could be retained. Ovaries deprived of their blood supply undergo pathological changes. The surgical menopause should not be regarded with undue apprehension. Of twenty-five cases of cervical cancer, twelve were inoperable and were treated palliatively with curette and cautery and the rest were subjected to total hysterectomy without any mortality and no unpleasant sequelæ. There were twenty-three cases of cancer of the body of the uterus, all of which were attacked by the abdominal route. There were fourteen cases of primary ovarian cancer, most of them associated with hydroperitoneum. Removal of the growth was impossible in five cases. Five patients died in the hospital. There are three good reasons for operating in these cases: 1, operation gives considerable relief for the rest of the patient's life; 2, recurrence may not occur, and 3, a complete diagnosis is impossible without a laparotomy. Patients with hydroperitoneum should not be tapped but should be subjected to exploratory laparotomy. Of 114 cases of simple cystic and solid growths of the ovary and broad ligament, one patient showed general peritonitis on admission and was treated with simple drainage; in ninety-seven cases the growth only was removed and in sixteen cases both appendages and the body of the uterus were removed. Here also nothing but the cervix was left unless a good working set of reproductive organs could be retained. There were four deaths. Of other pelvic disorders, there were fifty-nine cases of retroversion, which were treated with a Webster sling. Uncontrollable bleeding at the menopause was treated with supravaginal hysterectomy ten times. Thirteen cases of ectopic pregnancy required salpingectomy. The twenty-three other cases included an inverted uterus, a cyst of the common bile duct. desmoid growths of the abdominal wall, obscure cases of hydroperitoneum and cases of tuberculous peritonitis of the genitals (none primary).

There were eighteen deaths in 545 abdominal sections, of which fifteen patients were in poor condition from hemorrhage, infection and degeneration, or malignancy; the three otherwise healthy patients died from shock, embolism and pneumonia respectively. Neoplasms should be removed in times of good health.

Vaginal operations were done 406 times for genital prolapse; 112 cases of rupture of the perineum and rectovaginal fistula were cured; all but one of sixteen cases of urinary fistula were cured. The whole vulva was excised seven times for cancer and once for leucoplakia.

There were 249 smaller vaginal interventions for hematocolpos, septate vagina, unruptured hymen, senile endometritis, pyometra, cysts of the vulva, Bartholinitis, caruncle, polypi, sterility, spasmodic dysmenorrhea, cervical laceration, hypertrophied clitoris, retained products of conception and various explorations of the uterus. The mortality of 809 vaginal operations was nil.

Fractures.—A. H. Bizarro (*Annals of Surgery*, February, 1922) from a comparative study of 213 forearm and leg fractures presents the following conclusions:

Backfire is one of the commonest causes of forearm fracture (thirty-six per cent.) and slipping and twisting the ankle the commonest mechanism of leg fracture in these series. Fracture of the radius alone is the commonest in the forearm (seventy per cent.) and fractures of both tibia and fibula the commonest in the leg (forty-four per cent.). The radius was fractured in eighty-four per cent. of cases of forearm single and double fractures, and the fibula was fractured in seventy-nine per cent. of cases of leg single and double fractures. The lower third of the radius is the most fragile part of the bone and was fractured in ninety-one per cent. of single radial fractures, and the lower third of the fibula is the weakest point of the bone and was fractured in eighty-eight per cent. of single fibular fractures. The upper third of the ulna is the commonest seat of single ulnar fractures (sixty-six per cent.), and the lower third of the tibia the commonest place of single tibial fractures (seventy-one per cent.). The lower third of the radius and ulna is the commonest seat of double forearm fractures (seventy-two per cent.), and the lower tibial third the commonest level of the leg double fractures (eighty-eight per cent.). The lower third, the lower half of the upper third, and the middle third of the fibula is the order of frequency of these bone fractures when accompanied by tibial fracture. The ulna is usually fractured below the radial level of fracture (forty-three per cent.), and the fibula above the tibial (sixty-four per cent.). The classic fractures of Colles, Pott, and Dupuytren, as conceived by these authorities, are comparatively rare. Epiphysial strain, widening of the epiphysial line and the epiphysial fractures are commoner at the wrist. The marginal fractures of the radius (Barton, Letenneur) are rarer than the marginal tibial fractures. Longitudinal or medullary splits are commonest in the fibula. Chauffeur's fracture may occur at the upper end as well as at the lower end of both radius and ulna. The commonest direction of the fibular fractures is from before backwards and upwards and usually incomplete, and only seen in the lateral skiagram. Fractures of the tibial tubercle appear to occur in a growing bone, and fractures of the tibial tuberosity in an adult bone. Fractures of the upper half of the ulna, radius, tibia and fibula diaphysis are usually due to direct trauma.

Prevention of Formation of Postoperative Adhesions.—F. Rick (*Zentralblatt für Gynäkologie,* June 4, 1922) has revived an old idea, which consists of pouring a half to one litre of a warm (39° C.), sterile physiological solution of sodium chloride into the epigastrium before closing the peritoneum with the pelvis slightly elevated, in order to avoid the formation of postoperative adhesions. In eleven cases, of which seven showed extensive adhesions at the time of operation, neither subjective nor objective evidences of the presence of postoperative adhesions were demonstrable at subsequent reexaminations. The author was induced to use this procedure for the following reasons: 1, the visible activation of the peritoneum; 2, the desire to avoid postoperative adhesions resulting from the direct sloughing into the peritoneum; 3, a rapid warming of the cooled intestines; 4, the compensation for the loss of blood by the intraperitoneal infusion of sodium chloride solution rather than by the intramuscular or intravenous routes; 5, the diminution of the postoperative thirst, especially after the administration of scopolamine.

Bone Pegs.—George De Tarnowsky (*Surgery, Gynecology and Obstetrics,* September, 1922) concludes that: The clinical behavior of a beef bone graft depends entirely on the relative activities of the osteoblasts and osteoclasts. With proliferation of new cells from the living proximal and distal ends of the fractured bone keeping pace with absorption of dead cells from the graft, complete disappearance of the latter coincides with complete union of the fracture or filling in of the defect. With hyperactive new cell formation and sluggish absorption, the graft constitutes a sequestrum which either eburnates and remains in a state of quiescence or acts as an irritant foreign body with sinus formation and periodical extrusion of dead bone spicules. With hyperactive bone absorption and sluggish new bone formation the graft disappears by combined extrusion and absorption before union or filling in of the defect has taken place. The factors which enable one to attain the ideal, i. e., an even balance of absorption and proliferation are: first, the thorough trimming off of dead bone proximally and distally with curette and chisel; second, firm approximation of the bone graft to living bone; and, third, absolute asepsis. Finally, it seems that the term infection, as applied to bone surgery, is too loosely used and that in many cases of socalled septic results one is merely dealing with type three, i. e., rapid necrosis of the graft without infection—using the latter term in its proper sense.

Artificial Toes.—C. Cross (*American Journal of Surgery,* September, 1921), speaking of the need for better technic for the replacement of toes, summarizes as follows: Proper size and correct placement of artificial toes under feet from which toes have been amputated may restore normal walk and springiness to step. By relief of the constant strain on injured tissues and destroyed arches, patients are given ease and comfort and their efficiency is greatly increased. Much postoperative suffering can be relieved by artificial toes. As a means of differential diagnosis following bunion operations, the use of artificial toes will decide whether weakness in a foot is the result of the operation, or due to injured arches. Because of their rigidity, metal arch supports should not be permanently used under injured or ailing feet. When held rigid by metal splints, atrophy occurs quickly in foot muscles and adds to the disability, because the internal longitudinal arch was never intended as a weight bearing area. The weight bearing axis for the successful placement of artificial toes is the same as if the weight were distributed along the narrow blade of ice skates. All ailments and distortions of the feet require more treatment than is generally accorded them, and it is necessary that the treatment be given, and over a long period of time, to bring about the best results.

Radical Operation for Inguinal and Femoral Hernias with Simultaneous Laparotomy.—Hugo Hellendall (*Zentralblatt für Gynäkologie,* June 24, 1922) reports the case of a woman fifty-one years old, in whom he had occasion, while doing laparotomy for severe climacteric hemorrhages (oophorectomy), also to repair a femoral hernia, to which a large piece of omentum was adherent. He conceived the idea of closing the internal femoral ring with a peritoneal infolding suture and to fasten the uterus, which was rendered functionless by the castration, toward the right, so that it could be sewed as a pad against the internal femoral ring. The peritoneum adherent to the right femoral canal was resected and the peripheral portion remaining in the canal of the hernia. The ovaries were extirpated. The adherent uterus (from a previous operation) was separated and the vesicouterine fold was pushed back. The internal femoral ring was closed by interrupted sutures through the vesicouterine fold and adjacent peritoneum and the right round ligament was sutured to the peritoneal stump remaining in the peritoneal pocket. The mobilized uterus was pushed over to the internal femoral ring and its anterior surface was sutured there to the anterior abdominal wall so that it served as a pad against the internal femoral ring. Primary union followed. The uterus later became atrophied and produced no unpleasant symptoms.

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NEW YORK, WEDNESDAY, NOVEMBER 15, 1922

OBSTETRICS

Etiology of Ectopic Pregnancy.—Guido Poorten in Riga (*Zentralblatt für Gynäkologie,* May 13, 1922) believes that neither the theory of impediments in the path of the ovum nor that of insufficiency of the motor powers can explain all cases of ectopic pregnancy; in these inexplainable cases the cause must be sought in the ovum itself. The author attacks the question from the biological point of view. Every living tissue and cell possesses a certain vital activity, which varies in different cells, different individuals and even in the same individual at different times and under different circumstances. This variation also applies to the impregnated ovum and this is the deciding factor in the occurrence of ectopic pregnancy. The cause of ectopic pregnancy is inherent in the impregnated ovum and its power of further development. The majority of impregnated ova have a normal vital energy, which enables them to gain a foothold on arriving at the uterine mucosa, resulting in a normal pregnancy. Some ova are subnormal and are unable to gain such a foothold; they either die or are washed out. Others are hyperactive, leading to ectopic pregnancy, and owing to their excessive energy they gain a foothold in unsuitable places, as is shown by their earlier or later arrival either in the ovary or parts of the tube. If mechanical causes were responsible for the occurrence of ectopic pregnancy, the experimental production of ectopic pregnancy ought to be successful, but this is not the case, as is also shown by the rapid and deep destructive penetration into the tissues of very young tubal ova. This destructive growth is not a secondary process but primary and produced by the hyperactivity of the impregnated ovum. These three grades of activity are not sharply defined but show transitions. An ovum destined for an ectopic foothold and capable of hyperactivity may reach the uterus after a rapid and favorable passage, which explains the cases of abnormally deep growth of the placenta leading to rupture of the uterus, or a hypoactive impregnated ovum may reach the uterine mucosa and lead to an otherwise inexplainable case of abortion. Recurrences of ectopic pregnancy in the same woman is relatively not rare, which also shows that the cause of the process should be sought in the impregnated ovum.

Knot in Umbilical Cord as a Cause of Accidental Hemorrhage.—A. F. Grattan Guinness (*British Medical Journal,* June 3, 1922) reports a case of a bipara who was suffering from marked collapse as a result of a continuous but not severe hemorrhage. The fetal presentation was normal, the os admitted two fingers and was patulous. There were no pains and the fetal heart sounds were audible. Labor was induced and the cord was found longer than normal, with a single complete knot in it. The fetal circulation was completely shut off, causing a separation of the placenta and hemorrhage before the labor set in. There was marked fetal activity for some days previously.

Action of Ergot Preparations.—Being dissatisfied with the uncertain action of the usual ergot preparations, owing to their different modes of preparation, storing and collection and their resulting different actions, Peters (*Wiener klinische Wochenschrift,* June 22, 1922) tried the effects of ergotamine and tenosine. It was found that ergotamine and ergotoxine increase labor pains, that this effect appears after a short latent period and that the intensity of the effect depends upon the dose; they may even cause tetanus. The amine bases, which contain tenosine, produce a rapid and sudden rise of the tonus of the surviving animal uterus and a tetanic condition even after small doses. The author concludes that in cases of threatening atony of the uterus it is necessary to use ergotamin either during the expulsion period or certainly without fear previous to a prematurely developing tetanus of the uterus for the purpose of shortening the placental period of labor shortly after the birth of the child, or that immediately after expulsion of the placenta an injection of tenosine may be relied upon.

Reanimation of a Stillborn Infant by Intracardial Injection of Adrenalin.—N. A. Dacharry (*Semana Medica,* January 26, 1922) said that the mother had had nine previous labors, all delayed and difficult. Dystocia was evident. After sixteen hours of pains and eighteen more of discomfort she was exhausted, and the child was extracted after prolonged effort with forceps. Its heart was not beating. As speedily as possible one third of a cubic centimetre of adrenalin solution, one in one thousand, was injected in the fourth left intercostal space one half centimetre deep. Within a minute and a half the heart began to beat energetically, in ten minutes the child began to breathe, and in an hour's time both heart and lungs were working normally, and later the baby cried lustily and seemed like one whose birth had been normal. But convulsions occurred on the second day, with hemiplegia and gastric disturbance and high temperature, which continued till death on the ninth day. Autopsy showed that diffuse subdural hemorrhage had taken place at or soon after birth.

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Peptic Ulcer With Deformities of the Viscus, Evidenced by X Rays, Changed for the Better by Treatment*

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The treatment of peptic ulcer is still a mooted question. The majority of surgeons lay claim to the entire field for themselves, while most clinicians believe that gastric and duodenal ulcers in a general way should be treated medically, except where there are special indications for surgery. Penetrating or callous ulcers of the stomach, or duodenum, which nowadays can be frequently demonstrated by the x rays, have been considered by both physicians and surgeons alike as requiring surgical aid. For it was not believed possible or even probable that such far advanced pathological changes which showed marked deformities, easily recognizable by the x rays, could be restored to a normal state of health by medical means.

The doubt in the efficacy of medical treatment of peptic ulcers can be easily seen from the following statements made by Sir Berkeley Moynihan (1), who expresses himself as follows: "We ask for a series of cases in which the physician, the surgeon, and the radiographer are agreed that a gastric ulcer is present, in which medical treatment has been tried, in which all are confident that a healing of the ulcer has taken place, and that the healed ulcer has not again broken down."—"Unless evidence can be produced to show that the real chronic gastric ulcer, not the phantom which wrongly bears its name, can be healed by medical treatment, the surgeon who in the diagnosis of this condition walks by sight and not by faith, is entitled to state that his methods alone can secure the end desired. At present I do not know of any such evidence I can accept."

The present paper deals with peptic ulcers in which constant deformities were visible by x rays; in five there was a typical penetrating (callous) ulcer of the lesser curvature, in one a penetrating ulcer of the pylorus, and in six constant deformities of the cap. Surgeons, physicians, and radiographers would all unite in making a positive diagnosis of advanced peptic ulcer in these cases—they therefore fulfill the demands of Sir Berkeley Moynihan—and they show the possibility of being treated successfully by medical means, with a restitution of almost normal conditions with regard to the configuration of the stomach and duodenum, as evidenced by the x ray examinations.

Before discussing the cases I would like to mention that Hamburger (2), of Chicago, called attention to the utility of frequent x ray examinations in cases of gastric ulcer recognizable by x rays, in order to ascertain whether the treatment is of benefit or not. The same able clinician demonstrated a case of gastric ulcer with gradual improvement and subsequent favorable changes in the x ray pictures. I have frequently shown that a positive string test has become negative in about fifty per cent. of the cases after a two weeks' treatment of duodenal alimenation. Deformities visible by x rays are not present in all cases of peptic ulcer. When they exist they certainly bear the best testimony to the presence of a far advanced ulcer, and if after treatment they are missing this circumstance appears to be the best evidence of a change for the better, if not of a cure.

Since April, 1921, I have selected all cases of peptic ulcer with deformities (visible by x rays) for reexamination by the x ray immediately after treatment, and in some of them some time later. In this way it was possible to study with the eye the result of the treatment undertaken as influencing the pathological condition present. It is understood that not every case of peptic ulcer could be thus investigated, for many patients did not wish any x ray examination or had it done some time previously. Or again, in some of the cases with deformities the patients decided to be treated surgically or by other physicians so that I had no chance to follow them up.

Altogether in this year (April 1, 1921, to April 1, 1922) twelve cases with deformities were treated by duodenal alimentation. I shall describe a few in detail while the rest will be given in table form.

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*Read before the American Gastroenterological Association, May 1, 1922, at Washington D. C.

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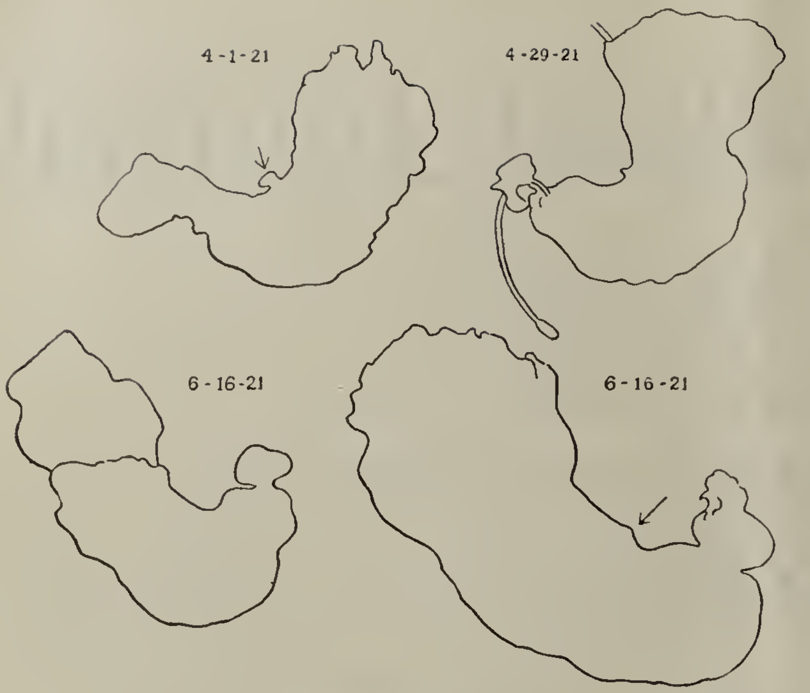


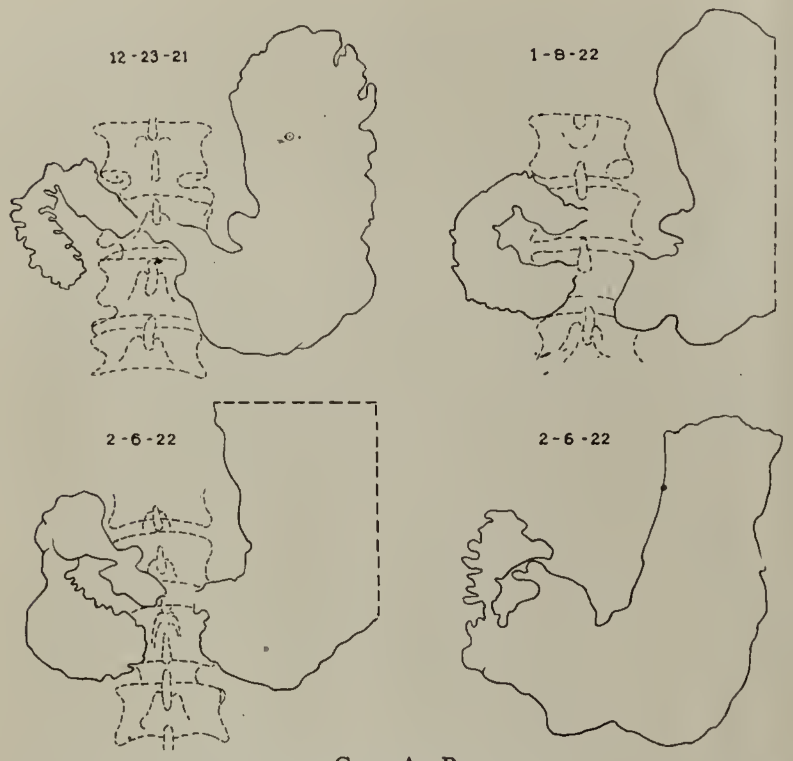
Case L. K.

Fig. 1.—L. K. April 1, 1921. Before treatment. Pouch of Haudek's niche distinctly visible.

Fig. 2.—April 29, 1921. The pouch has diminished to about 1/10 its original size; the tube is still visible lying in the duodenum.

Fig. 3.—June 16, 1921. Five weeks later. The niche has disappeared.

Fig. 4.—June 16, 1921. Same. Prone.



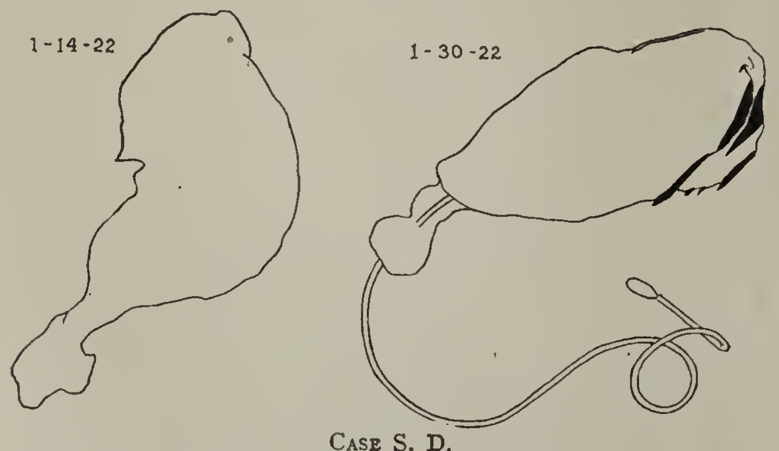
Case A. R.

Fig. 5.—December 23, 1921. Before treatment; big pouch at lesser curvature; duodenum fills very poorly.

Fig. 6.—January 8, 1922. Immediately after treatment; the pouch is a trifle smaller; the duodenum fills much better.

Fig. 7.—February 6. 1922. Prone; the pouch has disappeared.

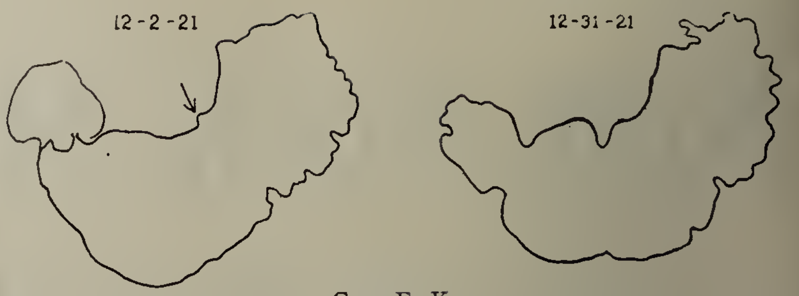
Fig. 8.—February 6, 1922. Same; erect.



Case S. D.

Fig. 11—January 14, 1922. Before treatment; small pouch at lesser curvature.

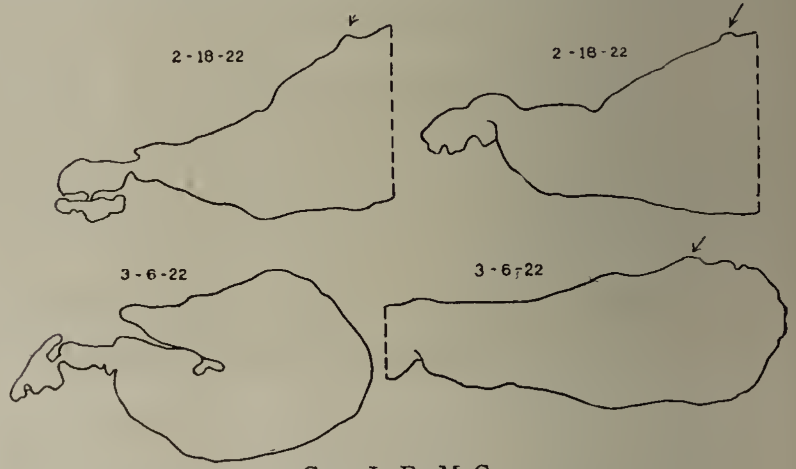
Fig. 12.—January 30, 1922. Immediately after treatment; tube still in duodenum and jejunum; the pouch has disappeared.



Case E. K.

Fig. 9.—December 2, 1921. Before treatment; small pouch visible at lesser curvature

Fig. 10.—December 31, 1921. After treatment; pouch disappeared.



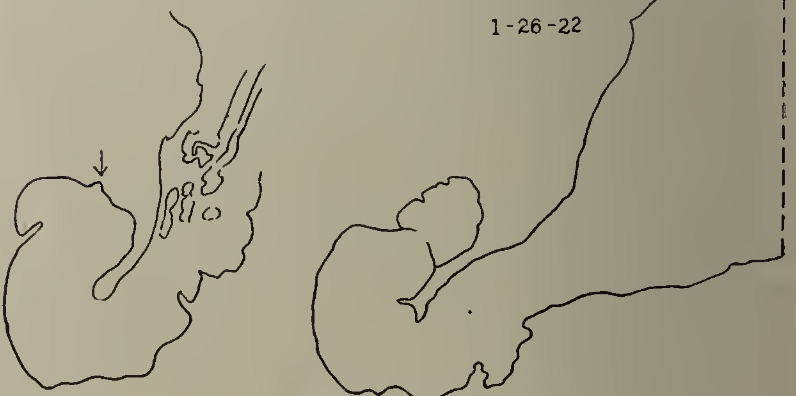
Case J. E. McC.

Fig. 13.—February 15, 1922. Before treatment; prone.

Fig. 14.—February 15, 1922. Left side; pouch visible.

Fig. 15.—March 6, 1922. After treatment.

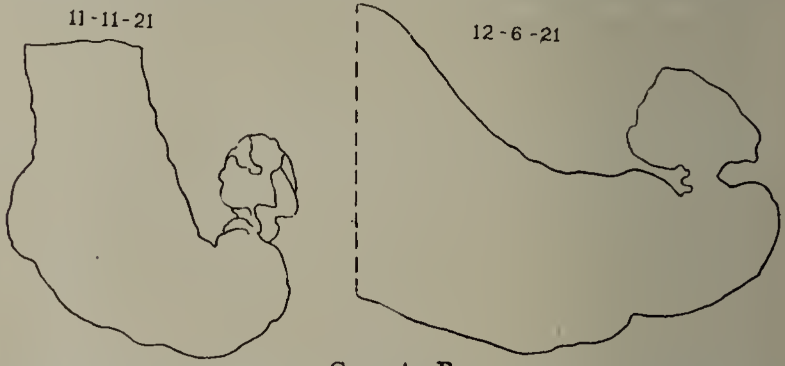
Fig. 16.—March 6, 1922. The pouch has almost disappeared.



Case H. A.

Fig. 17.—January 26, 1922. Before treatment; small pouch or niche noticeable at pylorus.

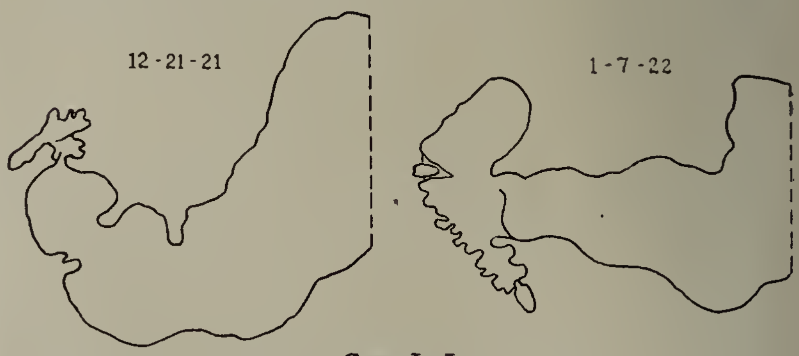
Fig. 18.—January 26, 1922. After treatment; pouch disappeared.



Case A. B.

Fig. 19.—November 11, 1921. Before treatment; duodenal ulcer with pronounced deformity of cap.

Fig. 20.—December 6, 1921. After treatment; cap almost normal.



Case J. L.

Fig. 21.—December 21, 1921. Duodenal ulcer with marked deformity of cap before treatment.

Fig. 22.—January 7, 1922. After treatment; the ascending portion of the duodenum appears normal and regular in outline.

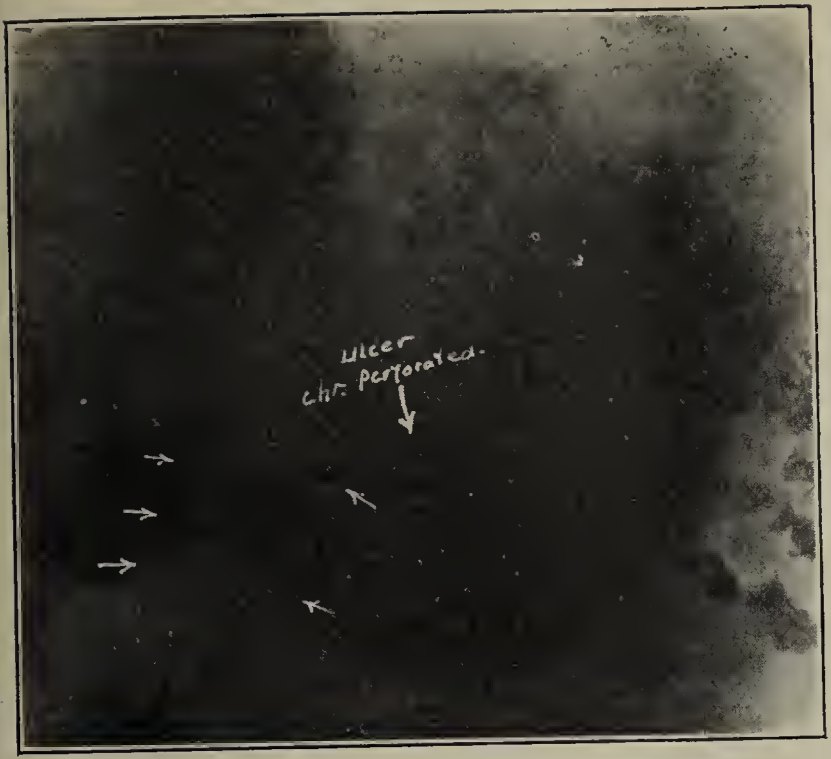


FIG. A.—Louis K., x ray photograph taken April 1, 1921. A pouch of considerable size is visible at the lesser curvature (Haudek's niche).

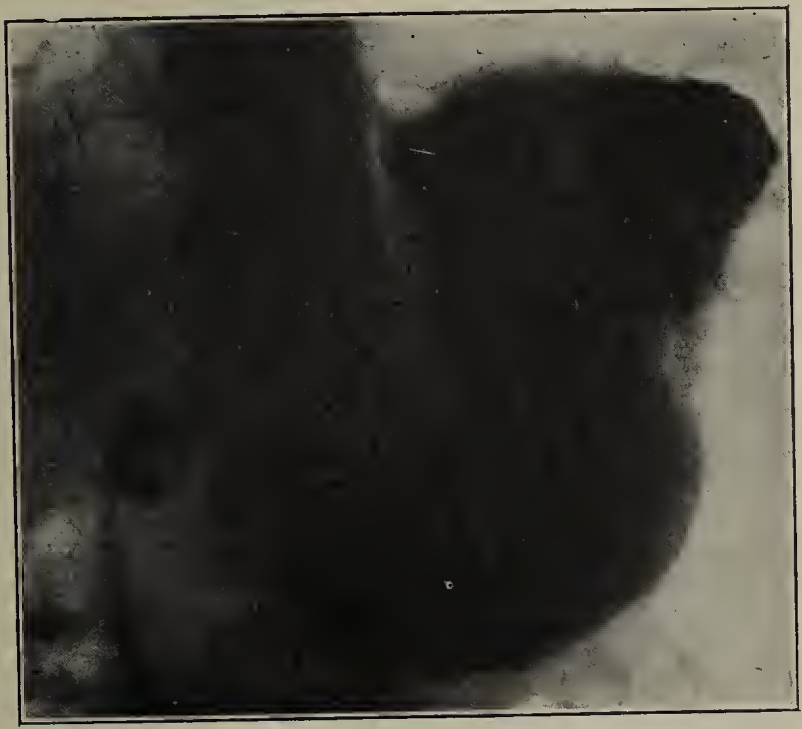


FIG. B.—Louis K., April 29, 1921. The pouch has diminished to about one-tenth its original size.

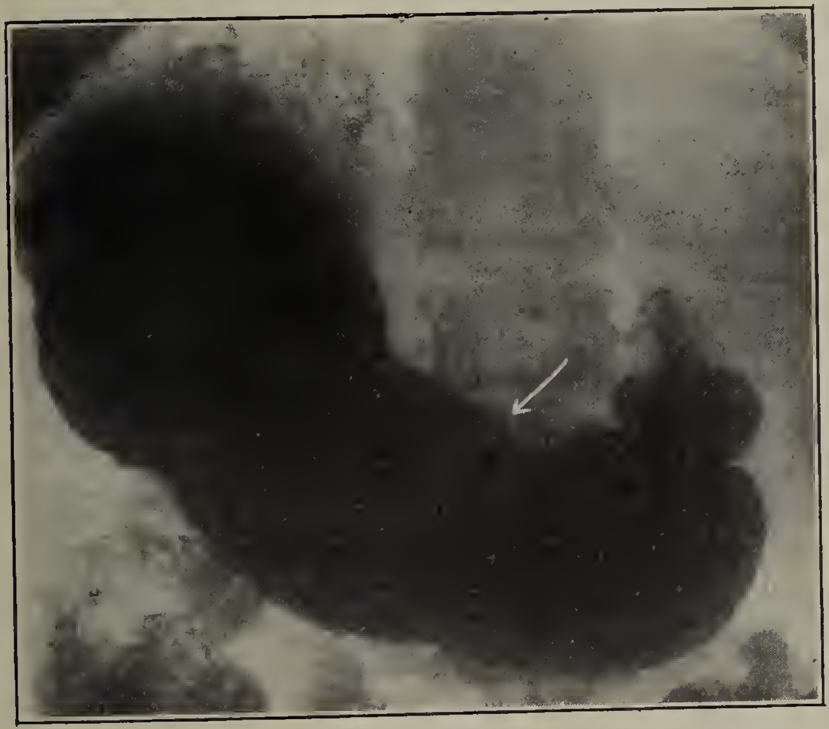


FIG. C.—Louis K., June 16, 1921. The pouch no longer exists.

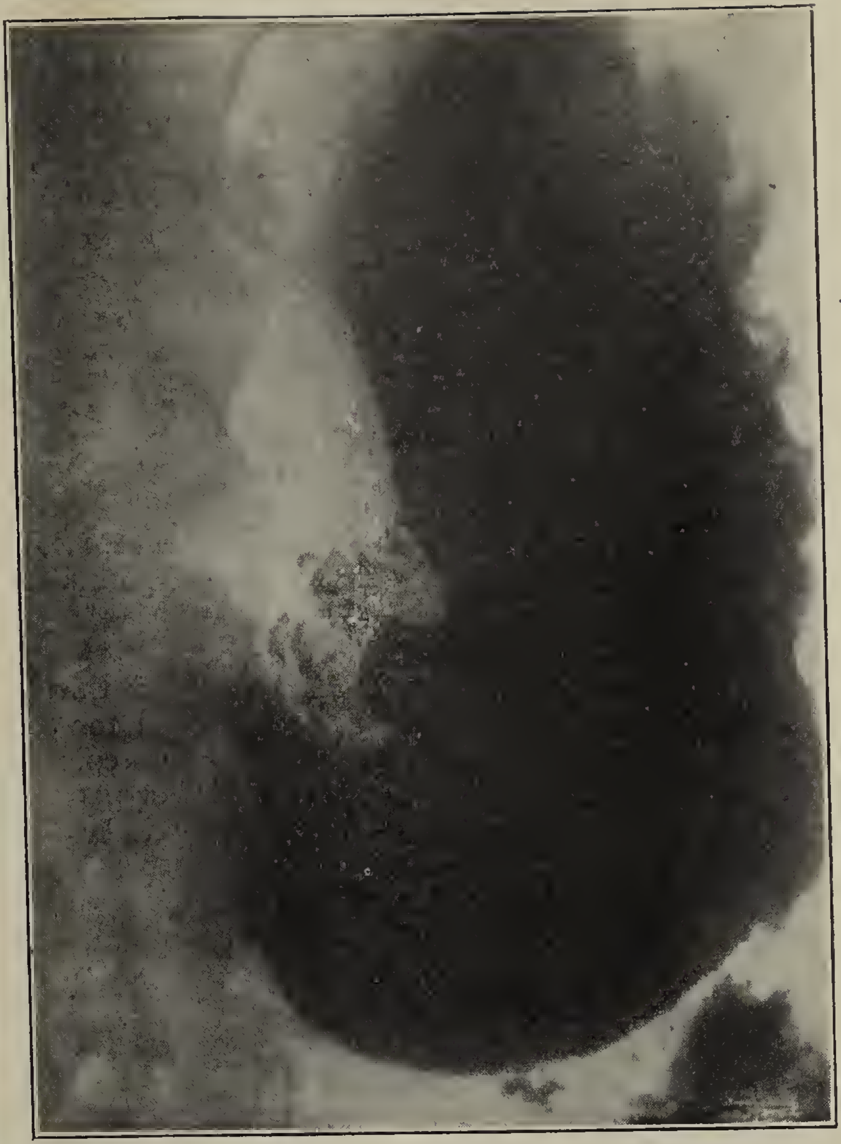


FIG. D.—Andrew R., December 22, 1921. X ray photograph shows a big pouch (Haudek's niche) at the lesser curvature.

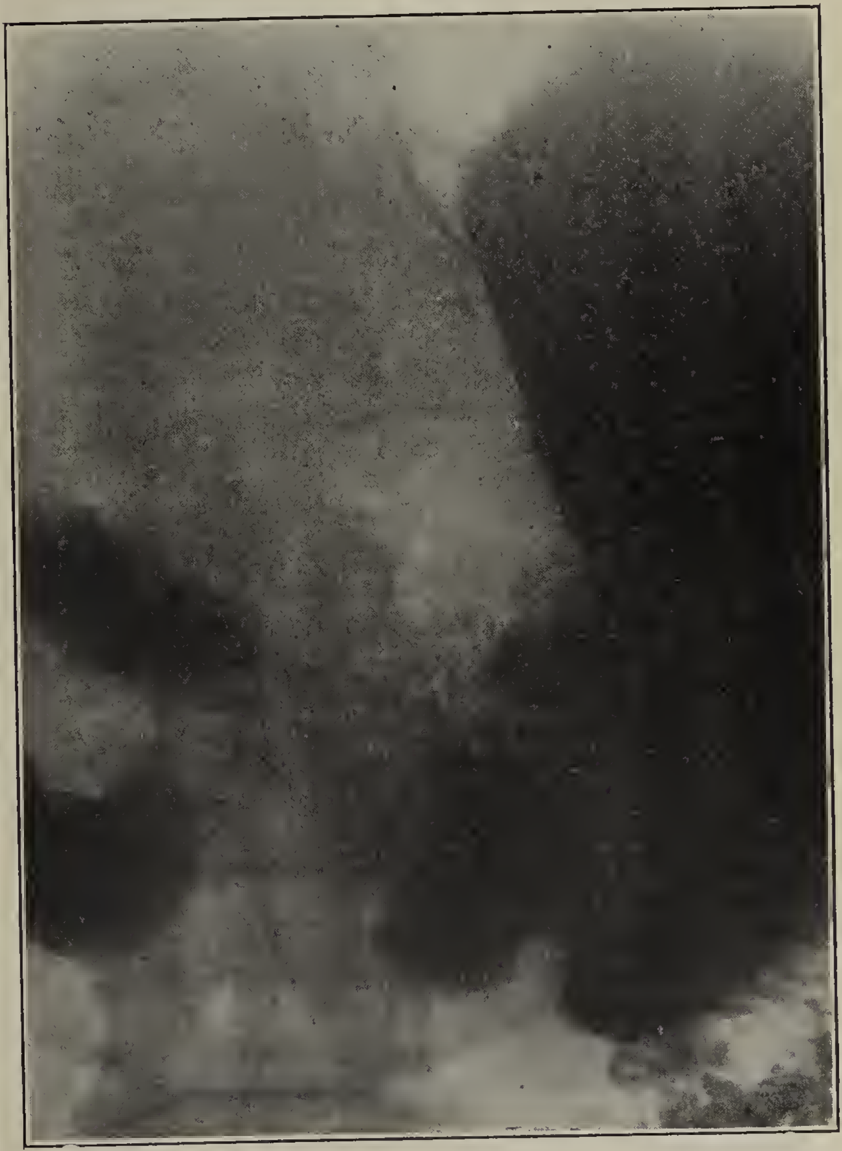
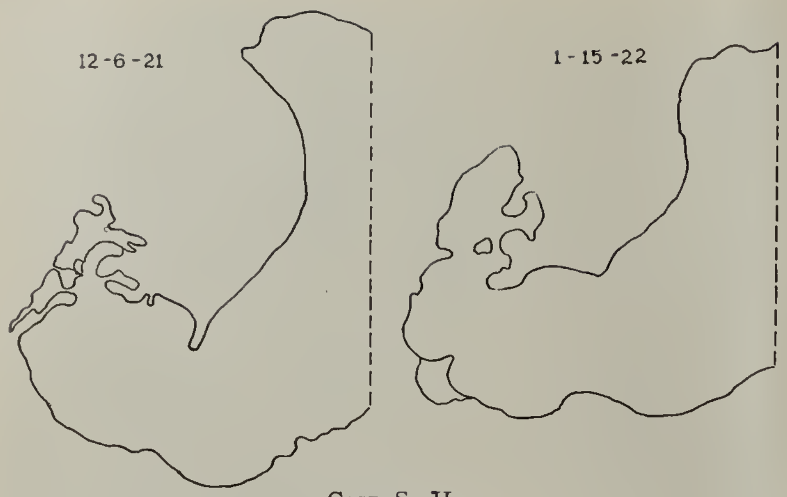


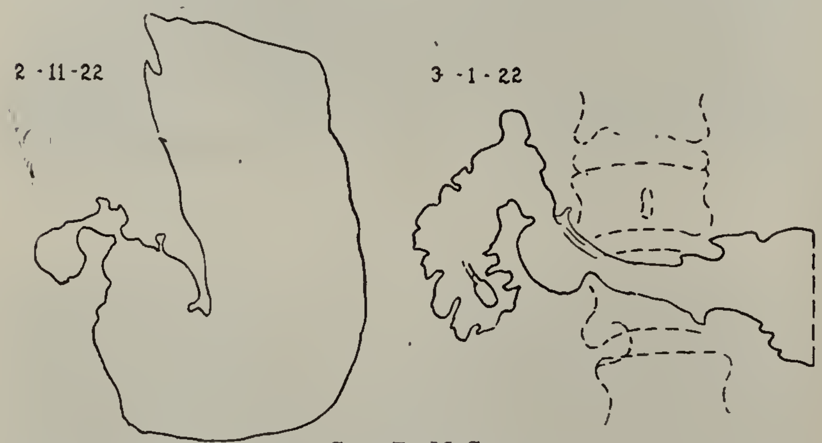
FIG. E.—Andrew R., January 8, 1922. The pouch appears a trifle smaller and the duodenum shows a better filling.



CASE S. H.

FIG. 23.—December 6, 1921. Hodgkin's disease and duodenal ulcer. Before treatment; marked deformity of cap.
FIG. 24.—January 15, 1922. After treatment; the deformity is considerably less pronounced, the beginning duodenum showing a better filling.

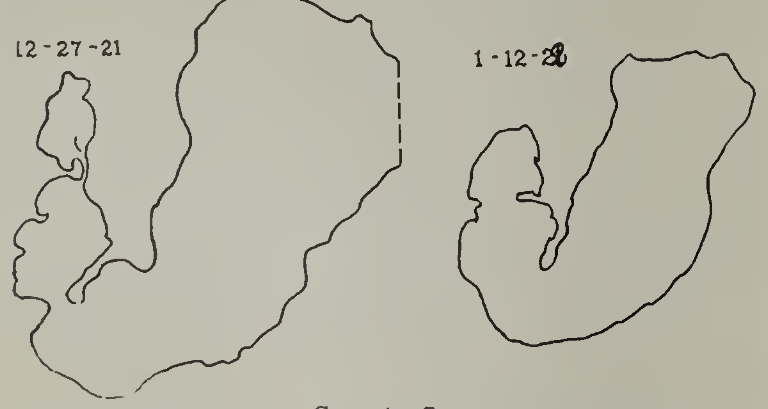
CASE I.—Louis K., April 3, 1921, aged thirty-seven years. The patient had been troubled for the past fifteen years with recurrent attacks of epigastric pains two to three hours after meals for periods of five to six weeks with free intermissions lasting from three to six months. Recently the attacks had become severer in character, the pains being more intense and lasting longer. The patient also awakened during the night with pains, from which he found relief by eating crackers and milk. He became more restless and lost in weight and strength.



CASE B. McC.

FIG. 25.—February 11, 1922. Duodenal ulcer with marked deformity of cap (three leaf shape); before treatment.
FIG. 26.—March 1, 1922. After treatment; the beginning duodenum, although not normal, shows a better filling capacity.

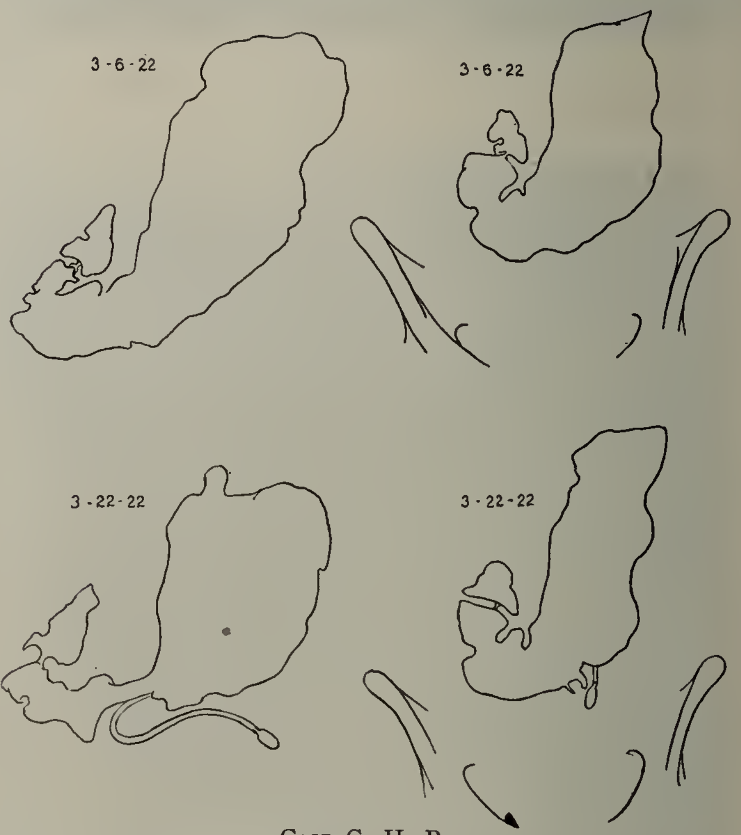
An x ray picture taken at Philadelphia by Dr. Pfahler showed a penetrating (callous) ulcer of the lesser curvature of the stomach (Fig. A). The patient was advised by several physicians to be operated upon, but a near relative of his having died soon after an abdominal operation the patient was loath to undergo the risk of the surgical procedure. Dr. Epstein, of Newark, N. J., a personal friend of the patient, consulted with me in regard to the best mode of procedure under these circumstances. We agreed to have the patient undergo a systematic examination and determine whether medical means would be applicable in this case. The gastric contents showed HCL, plus; acidity, 70; blood, negative; no food stagnation. The duodenal bucket string test showed the pylorus permeable; a blood stain at about eighteen and a half to nineteen inches from the lips, indicating the presence of an ulcer at the lesser curvature of the stomach.



CASE A. G.

FIG. 27.—December 27, 1921. Duodenal ulcer with deformity of cap; before treatment.
FIG. 28.—January 12, 1922. After treatment; cap has an almost normal shape.

Inasmuch as I had seen several penetrating ulcers of the stomach apparently cured by duodenal feeding, I advised this mode of treatment before deciding upon an operation, which could be reserved in case of failure of the above mentioned procedure. The patient was then treated by duodenal alimentation for two weeks. He felt perfectly comfortable all the time, experiencing no pain from the time the duodenal feeding was instituted. Previous to withdrawing the tube I had new x ray pictures taken by Dr. W. H. Stewart, one picture with stomach empty and another one after barium ingestion into the stomach. The latter photograph (Fig. B) showed the pouch to have diminished to about one tenth of its original size; two or three months later another x ray was taken which demonstrated an almost entire disappearance of the afflicted area (Fig. C). Immediately after the period of duodenal alimentation the patient picked up and could eat a liberal diet with impunity. He improved steadily, gained in weight and strength, and remained well up to the time of this report. He could partake of banquets and could eat almost everything without restrictions.



CASE C. H. R.

FIGS. 29, 30.—March 6, 1922. (Prone and erect) duodenal ulcer with filling defect in cap (slit); before treatment.
FIG. 31.—March 22, 1922. After treatment; prone; slit still visible, although not so much.
FIG. 32.—March 22, 1922. Erect; slit not visible.

Name	*Symptoms*	*Physical signs*	*String test*	*Gastric contents*	*X Ray*	*Results*
1. E. K.......	Pain in epigastrium one hour after meals; lasts two hours; relieved by food and soda; no vomiting or hematemesis; tarry stools; ten pounds loss in weight.	Tenderness in upper part of epigastrium; stomach not dilated.	Positive; blood stain; 51-53 cm.	HCl—0; acidity—0; blood and lactic acid negative.	Penetrating ulcer of the lesser curvature.	Ulcer and symptoms disappeared.
2. S. D.......	Pain in epigastrium radiating to back two hours after meals and relieved by eating; no vomiting, tarry stools or loss of weight.	Tenderness in epigastrium.	Positive; blood stain; 47-48 cm.	HCl—10; acidity—18; blood negative.	Penetrating ulcer of the lesser curvature near the cardia.	Symptoms and ulcer disappeared.
3. J. E. Mc...	Gastric distress and hemorrhages from the stomach and the bowel (hematemesis and melaena)..	Tenderness in abdomen; slightly enlarged liver.	Positive; blood stain; 48-52 cm.	HCl—50; acidity—70; blood present.	Penetrating ulcer of the lesser curvature.	General improvement; x ray disappearance of the niche formation.
4. A. B.......	Pain in epigastrium ten minutes after meals; radiated to the left side and back; aggravated by food; regurgitation, sour material but no vomiting; tarry stools; good appetite; lost eleven pounds in weight.	Tenderness in epigastrium. liver enlarged four cm. below costal margin.	Negative	HCl—39; acidity—50; blood negative.	Ulcer near the pylorus with deformity.	Symptoms disappeared; deformities in x ray cleared up.
5. S. H.......	Pain in epigastrium radiating to interscapular region; patient feels weak and lost fifteen pounds in weight.	Tenderness in epigastrium; liver enlarged to five fingers below costal margin; enlarged inguinal glands.	Negative	HCl—81; acidity—99; blood negative.	Duodenal ulcer with gastric retention.	Condition very much improved.
6. J. L.......	Recurrent epigastric pain not related to meals; nausea and vomiting, relieved by food; eructations of gas; seventeen pounds loss in weight.	Tenderness in abdomen.	Positive; blood stain; 56-58 cm.	HCl—80; acidity — 100; blood present; trace.	Ulcer with marked deformity.	Symptoms gone; x ray shows great improvement.
7. A. G.......	Dizziness; epigastric pain; loss in weight and strength.	Dilated and prolapsed stomach; liver enlarged.	Positive; blood stain; 50-62 cm.	HCl— +; acidity—25.	Duodenal ulcer with deformity of the cap.	Greatly improved; deformity almost disappeared.
8. Mrs. C. H. R	Pain in the epigastrium; loss in weight.	Dilated stomach.	Positive; blood stain; 56-60 cm.	HCl—50; acidity—70.	Persistent defect in first portion of duodenum.	Defect greatly changed for the better.

CASE II.—Andrew R., seventy years old, December 14, 1921. This patient complained of pain in the stomach three years ago, which usually came on about two hours after meals. Examination at that time revealed hyperacidity but no evidence of ulceration. Previous to this time the patient never complained of any stomach trouble. Since the patient was seen three years ago he had been enjoying good health until about two months ago, when he began to complain of severe pain in the abdomen. This pain was located in the epigastrium, would occur two to three hours after meals, and would spread over the entire abdomen. At times he would vomit and this gave him some relief. The vomitus at times contained blood. At the onset of the present trouble food relieved the pain but lately it made it worse. Patient lost twenty pounds in two months, and when he entered the hospital (Lexington Hospital) he was very weak. His bowels were constipated and he could not eat much. The pain was located in the epigastrium and radiated all over the abdomen.

Physical examination revealed an apparent tumor at the epigastrium. The man was much emaciated. A blood count showed the presence of a secondary anemia. The gastric contents showed HCl plus; acidity, 45; occult blood present. Duodenal string test showed a positive blood stain in the stomach. The stomach was dilated, the greater curvature extending to a hand's width below the navel. On aspirating the stomach contents through the duodenal tube free blood was found. Wassermann reaction was negative.

X ray examination showed an extensive penetrating (callous) ulcer of the lesser curvature (Fig. D). The patient absolutely refusing an operation, the duodenal tube was introduced, reaching the duodenum after three days' waiting and with the aid of frequent administrations of atropine. When the duodenal alimentations were established the patient began to feel better. After two weeks' feeding cautious alimentation by the mouth was substituted and the patient progressed rapidly (Fig. E). Six weeks after the cure there was no trace left of the penetrating ulcer (Fig. F). Patient had meanwhile gained fifteen pounds in weight.

CASE III.—Harry A., fifty-one years old, December 5, 1921. Family history: Mother died of cancer of the stomach. Past history: For the past twenty-seven years the patient had had trouble with the stomach, i. e., dizziness, belching, headaches, and constipation. Four years ago he began to have pain two hours after meals. This pain would last a few months and then disappear for a month or two. The periodical attacks of pain lasted until six months ago when the pain was more or less constant after each meal. Present history: For the past six months patient had a sharp pain in the epigastrium two hours after meals, which radiated around to the sides of the abdomen and usually lasted from an hour to an hour and a half unless relieved by taking food or bicarbonate of soda. Sour gaseous eructations followed the disappearance of the pain. The patient never vomited; was weak, constipated, but had not lost any weight.

Physical examination showed a dilated stomach (splashing sound down to three fingers below the navel). Gastric contents: HCl plus; acidity, 30; string test — blood stain at fifty-five to fifty-six cm.; bile below sixty cm.; x ray revealed a niche right at the pylorus.

The patient was treated by duodenal alimentation for two weeks. An x ray taken by Dr. H. A.

Rafsky a few days after the duodenal feeding period revealed the disappearance of the niche and a normal cap. Patient now feels perfectly well and can eat a liberal diet.

Case IV.—Mrs. B. McC., fifty-eight years old, February 9, 1922. In August, 1920, while on a trip to Canada, the patient had an attack of nausea, vomiting, and diarrhea lasting two days. There was no pain but she felt very weak and had black stools; was jaundiced for two or three days with this attack but had not been since that time. Two to three months later she began to have a dull aching pain in the epigastrium which extended through to the back and had become more frequent and severe. The pain had no relation to meals but was relieved by bicarbonate of soda; bowels were constipated; the patient had lost ten pounds in weight.

Physical examination did not show anything of importance. Gastric contents, HCl plus; acidity, 80; blood, negative; string test — blood stain forty-eight to fifty-one cm.; duodenal contents, light yellow, greenish tinge; turbid, alkalinity, 20; A, 7; S, 2; T, 3; few cholesterin crystals. The blood count showed a secondary anemia; the urine, specific gravity, 1008; albumin, some white blood cells and many bacteria; stools were negative for blood. X ray examination showed a persistent defect in the first portion of the duodenum (three leaf shaped cap) and six hour retention.

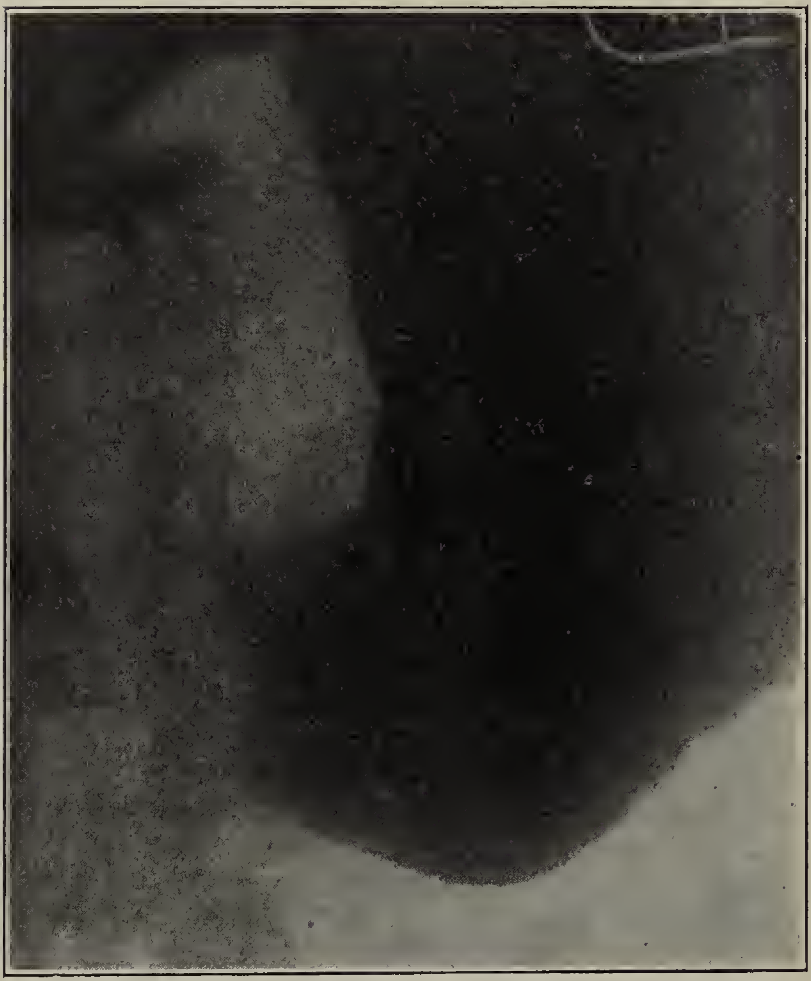


Fig. F.—Andrew R., February 6, 1922. The pouch has entirely disappeared.

The patient was treated by duodenal alimentation for two weeks; no pains were felt since this regime was begun. At the end of the treatment a new x ray was taken. The duodenum showed a much more normal course, the cap being present although not perfect in form. Patient is now well and is gaining in weight.

The remaining cases of peptic ulcer with deformities are given briefly in the accompanying table.

REMARKS.

In looking over the twelve described cases we find, as already mentioned above, that there were five penetrating (callous) ulcers of the lesser curvature of the stomach, one penetrating ulcer of the pylorus, and six clear cut cases of duodenal ulcer with constant deformities of the cap.

They were all benefited by the duodenal alimentation treatment; and there was a change for the better in the pathological findings as revealed by the x rays, the niche formation having entirely or almost entirely disappeared and the cap deformities likewise changing to almost normal conditions. At the same time there was a general return of well being and health.

In one of these cases (A. R.) the change for the better in the niche immediately after the feeding was noticeable in a small degree, the niche becoming a trifle smaller and the duodenum filling up much better. The patient, however, continued to improve on a liberal diet and bismuth medication, so that in a period of about six weeks it had entirely disappeared, as the x ray pictures will show (Fig. F).

It is thus evident that even ulcers of long standing with marked pathological changes (or the so-called callous ulcers) of the stomach or duodenum are susceptible to cure by medical measures. Nor is this, according to my experience, a rare event. For the cases detailed have been taken seriatim and selected only for their gravity in demonstrating lesions easily recognizable by the röntgen method. (I here wish to express my thanks to Dr. W. H. Stewart, radiologist to the Lenox Hill Hospital, and Dr. H. A. Rafsky for the fine x ray pictures taken for me.) As far as I recollect there was during the period (winter, 1921-1922) but one more case of penetrating ulcer of the stomach (visible by x ray) in which I tried duodenal alimentation for four or five days but gave up the treatment on account of the persistence of pain and continued small hemorrhages. This patient was advised to be operated upon. Dr. F. Torek performed a gastroenterostomy which cured the patient.

Based upon these experiences I must conclude that as a general rule most varieties of peptic ulcer, even the graver forms, are amenable to medical treatment. In my cases I have applied duodenal alimentation as a good method of supplying rest to the affected part and ample nutrition to the organism. But I do not doubt that similar results may be obtained by other methods of treatment, taking perhaps a somewhat longer period of time to accomplish a cure. All these questions will of course require further study and elucidation. But the main fact exists that peptic ulcers can be completely cured by medical measures.

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20 East Sixty-third Street.

Phases of Gastrointestinal Infection, Pathology and Treatment

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THE VALUE OF ENTEROANTIGENS IN THE TREATMENT OF GASTROINTESTINAL DISORDERS.

Ten years of intensive study of chronic intestinal invalidism have convinced me that the fundamental factor in chronic nonspecific colon disease is streptococcus and bacillus coli infection and that success in the care of this widespread condition requires that the patients be studied and treated from this viewpoint alone. Convincing evidence in support of this is to be found both in the pathological conditions disclosed at operation and in the results of therapeusis.

Chronic intestinal toxemia is a definite entity and is the primary cause of the protean symptoms characteristic of chronic intestinal disease. It may have one or more of the following sources: 1, from split protein and other products of bacterial food decomposition in the lumen of the gut; 2, from biochemical changes in the epithelial secretions of the gastrointestinal tract and its derivatives, the liver and pancreas; 3, directly from the bacterial focus in the intestinal wall.

Coombe, Metchnikoff, and others have made exhaustive studies of the chemical changes in the intestinal contents among chronic intestinal invalids and have contributed valuable information concerning the causes of intestinal toxemia. Coombe's theories as to the lines of defense against intestinal poisoning are sound and he seems in the main correct so far as he has gone. However, as regards etiology and therapeusis he places very little stress upon the gastrointestinal pathology and the general constitutional conditions that result from the bacterial toxemia, giving undue attention to the intestinal contents.

Years ago Draper proved that the bowel contents bore no relation to the cause of death or to the symptoms in intestinal obstruction, and the importance of his researches to the problem of gastrointestinal invalidism is just beginning to be recognized. Taylor's studies (1) on the relationship between anomalous abdominal bands and chronic invalidism support Draper's theory of its genesis especially as regards the oral portion of the small bowel, and gives assurance that surgical prophylaxis will soon be successfully practised in childhood. Ten years ago I became convinced of the pathogenicity of the colon bacillus and of its etiological importance in chronic intestinal toxemia, since which time I have had ample opportunity to add to the evidence already collected (2).

The direct or exciting origin of chronic intestinal disease is, then, triple, from bacterial byproducts of food in the gut lumen; from autogenous nonbacterial metabolic products arising from the digestive epithelium; from local bacterial foci in the intestinal wall. Of these the last is by far the most important. Indirect causes are of equal importance because often removable if discovered early enough. These are due to congenital and acquired conditions.

Keith (3) has ascribed alimentary stasis to defective innervation in certain definite nodal areas in Auerbach's plexus with gross pathological changes in the nerve fibres. McClure (4) is inclined to consider these structural changes as late events in the process and secondary to low grade bacterial infection—a view with which I concur.

Bryant (5), speaking of his now classical herbivorous and carnivorous types of man, says: "One cannot work much with type without more and more realizing that it is a valuable aid in the diagnosis and treatment of disease." Taylor (6) says: "Anomalous membranes are present in from fifteen to twenty-five per cent. of new born infants. They cause nutritional disturbances, nervous debility, usually termed neurasthenia, and occasionally mild psychoses."

Every modern comparative morphologist features the importance of the close relationship of stomach and colon and the frequency with which variations in the latter cause pathological conditions, the result of incompatibility with the upright position. Gravitational factors are well known to be of great indirect importance in the etiology of gastrointestinal diseases, particularly among the hyperontomorphic types of mankind. Overwork, bad hygiene, continued improper food, are important acquired contributory causes. The continued use of laxatives and cathartics irritates the bowel and is also often an important factor in the causation and continuance of the toxemia. Somewhat more remote indirect factors are specific infections, as typhoid, dysentery, and tuberculosis.

SYMPTOMATOLOGY.

The most impressive symptom of chronic intestinal toxemia is caused by the early involvement of the nervous system. In 1917 I stated (2) that, "The nervous system is almost invariably affected in whole or in part by chronic intestinal toxemia." Gastrointestinal symptoms are often so slight that these cases naturally come under the care of the general practitioner or of the neurologist, to remain unrecognized, so that much valuable time is lost. These symptoms, especially constipation, are often attributed to a disordered nervous system, the "cart," as is often the case, being "placed before the horse." The ordinary methods of treatment, such as massage, electricity, hydrotherapy, laxatives, and even diet, serve only to camouflage the main issue.

Constipation is the result not the cause of intestinal toxemia. It is just as much a protective symptom as is diarrhea. Its purpose is to induce surgical rest and it may alternate with or terminate in diarrhea—symptomatic results of the toxemia upon neuromuscular control (7). The following case history demonstrates a characteristic and profound involvement of the nervous system, the result of a lesion of the bowel:

Case I.—A patient in my hospital service was brought in with the diagnosis of tetanus. The symptoms were significant of tetanus, even to the locked jaw. The abdominal signs were obscured by the general rigidity of the entire muscular system. A gastrointestinal history of constipation and vomiting was obtained only after death. Autopsy revealed a strangulated and gangrenous bowel caused by volvulus, and no tetanus organisms were present. The condition was in reality a tetany caused by intestinal toxemia.

Draper's (8) demonstration of the pseudotetanic death which follows high intestinal obstruction, as described by him in 1907, shows the importance of animal experimentation in medical research and explains this otherwise obscure case. For here the tetanoid symptoms were due to toxins originating in biochemical changes in the epithelial lining of the gut, as already referred to. Eisberg (9) has elaborated upon these findings.

Indications for abdominal surgery in chronic intestinal disturbances have been considerably modified within the past few years, the result in part to improved methods of x ray gastrointestinal diagnosis, but more directly to an increasing knowledge of the effect upon the abdominal symptoms of the removal of focal infections. The former procedure was to operate for abdominal pain of obscure origin; the modern tendency is to delay laparotomy until all evident focal infections have been removed. Norman and Eggston (10) call attention to the necessity of a searching examination for occult foci of infection in the whole of the gastrointestinal tract, in every patient presenting "a clinical syndrome characteristic of toxemia." Two points in their paper need careful consideration; one is that the authors consider it rare to find a person with an infected mouth that has a noninfected lower digestive tract; the other is that "intestinal stasis in the majority of instances is the result of intestinal infection." These observations are in accord with my own findings and with those of McClure.

In spite, however, of the fact that in many instances the abdominal symptoms subside after thorough detoxication of the patient, in about eighteen per cent. observed by Cotton (11) the secondary foci in the abdomen are so well established as to necessitate laparotomy. For the success of this surgical work an intimate knowledge of abdominal pathology is requisite. In order to prove the nature of a disease it is necessary to prove specificity. As streptococci and colon bacilli are supposedly nonspecific organisms, each case must be studied intensively in order to demonstrate such specificity. Such studies show that these bacteria have numerous strains. They are rarely found in the blood stream, even in the most profound toxemia and advanced cases. It is generally conceded, therefore, that the toxemia from the bacteria themselves, or from their metabolic products, is the harmful agent. The outstanding, new and important idea is, that the colon itself, or large areas of it, constitutes an important and hitherto unrecognized and underestimated highly toxic local focus.

COLON PATHOLOGY.

The pathological studies herewith presented have been made upon segments of colon tissue removed at operation by Dr. J. W. Draper, at the State Hospital at Trenton, under the direction of Dr. Henry A. Cotton, and opened immediately under formalin, according to the technic ordered by Dr. James Ewing. This series, consisting now of more than one hundred and fifty specimens, is unique and valuable. The earlier specimens were largely right sided, with only occasional material from the left side. More recently, however, Dr. Draper having found that the mortality of total colectomy is not appreciably greater than that of right sided resection, there has been abundant opportunity in the last fifty cases to study segments from the entire colon.

This report is abstracted from the pathological findings by Dr. James Ewing, and from those of Dr. Ray Buhrman, pathologist to the State Hospital at Trenton, under the general direction of Dr. John F. Anderson. Use has also been made of a report upon a single case by Dr. Barnet Joseph, pathologist to the Kings County Hospital, New York, to all of whom acknowledgment is made.

Dr. James Ewing (18), reporting on sixteen average specimens, says: "The great majority of the specimens show very definite gross anatomical lesions, the most marked being pigmentation of the mucosa. This is most prevalent in the sigmoid but is often present throughout. It is occasionally associated with anemia and with fatal dystrophies of the nervous and muscular systems. Hernial protrusions, varying from one to two centimetres in depth, were common. Here the wall was thin, sometimes very thin, and the mucosa usually eroded or ulcerated. Through this it is obvious that absorption of fluids and bacteria readily occurs. The pouches were most marked in the cecum where access to them was tortuous, particularly when the wall of the colon was fixed by external adhesions. The serous surface was generally the seat of a chronic productive inflammation with occasional regions of denser fibrous tissue appearing as areas of abnormal bands and striæ. It is probable that these were largely due to the mucous membrane lesions. There was a general atrophy of the lymphoid apparatus inside and outside of the gut, which probably accounted for the presence of bacteria reported to have been found by culture in the lymph nodes of the mesentery. These may not have great significance. More important is the demonstration of hernias, pouching, thinning of the wall, pigmentation and ulceration of the mucosa, which together form an impressive anatomical basis for the theory of intestinal intoxication which undoubtedly existed in severe degree in the cases exhibiting such lesions."

Dr. Burnett Joseph, speaking of the microscopical findings in the tissue of a cecum and right colon, says: "The bloodvessels are filled with leucocytes and apparently thrombosed terminally so that the tip of the villi are covered with a mass of hemorrhagic material—thrombophlebitis. Areas of the sections show a diffuse hyperplasia of the lymphoid tissue, to the extent that the zone lying between the mucosa and the submucosa is a compact mass of lymphoid cells, with an occasional area of hyperplasia of the lymphoid follicles. In these latter there is an occasional mitotic figure. In certain areas the ulceration extends to the outer muscular coat. The muscularis mucosæ is for the most part definitely infiltrated and distorted. Attention must be directed to the extensive increase in lymphocytes. Diagnosis: Chronic proliferative colitis with thrombophlebitis as a base."

Dr. Ray Buhrman, pathologist to the State Hospital at Trenton, describing a typical case, says: "The mucosa of the colon is dark, grayish, congested; general atrophy, walls thin, mucosa wrinkled; many ulcerated areas, especially at the splenic flexure. Microscopic examination showed a quantity of pigment filling the endothelial cells and masses of pigment, enveloping groups of cells of three or four in number, in areas showing round cell infiltration; also an unusual number of endothelial cells and profuse round cell infiltration of the mucosa; hyperplasia of lymph nodes with destruction of the muscles; bloodvessels engorged; edema marked."

In reviewing and condensing these separate opinions, it will be seen that there is no possible question as to the presence or extent of the pathological changes. They are characterized by severe alterations amounting almost to complete destruction of many of the important structures of the bowel wall, particularly of the epithelium. Further investigation in the clinical field will demonstrate the degree to which the bacteria causing these changes stand in etiological relation to the symptoms.

The logical place of entry, either of the body cavity or the canal and its out buds, the liver and pancreas, for streptococci, is at either end of the gastrointestinal tract. The mouth is the more favorable site, especially the teeth and tonsils, where cracks in dental enamel, abrasions of the mucosa, etc., give abundant opportunity for breaking through into the body cavity. The lymphatics act as distributing agents. Infected teeth and tonsils abound in streptococci of various strains and of varied virulence. The nasal sinuses may be involved, but less frequently, with the exception of the maxillary antra, which are often infected from the teeth and which are frequently overlooked.

Glogau (12) cites insanity following operation for mastoid abscess and considers the mental hallucinations of probable two fold toxic origin, from the local infection and from intestinal toxemia.

The bacterial flora is very extensive in the mouth but gradually diminishes aborally, until the colon is approached, so if infection travels from the mouth to the intestine it probably does so principally through the lymphatics. This reasoning is by analogy rather than by direct proof—ascending infection of the kidney is known to be transmitted by way of the lymph route, as is also the destructive tubo-ovarian infection from the glandular nidus in the cervix. The colon bacillus has probably a different mode of entrance from that of the streptococcus as it is found infrequently in the teeth and tonsils, fairly frequently in the duodenum and gallbladder, its natural habitat being the large bowel. Nature's provision for digestion evidently developed in harmony with the bacterial flora of the large intestine, so that today the colon bacillus probably constitutes a valuable digestive aid, for the fact of true symbiosis has occasionally been proved to occur in nature. Therefore under normal conditions this bacillus, perhaps in all of its strains, may be harmless or even useful, undergoing pathogenic mutation only when the protective epithelium of the bowel is injured. Local conditions probably induce mutation, altering these bacteria and causing toxic secretions. Toxic symptoms undoubtedly do not arise unless the mucosa is injured for it is the protective barrier which guards the body cavity from invasion.

The former methods of identifying colon bacilli and streptococci by the gram positive and negative classifications are inadequate. We use the fermentation tests on manite, lactose and salicin, devised by Holman and others. By this method we have identified in our office laboratory seven strains of streptococci and four strains of colon bacilli. This technic affords more definite knowledge of the types of bacteria and is therefore invaluable in the preparation of polyvalent vaccines and sera.

Since we are dealing with an infectious process we are concerned with all its well known factors, antigens and antibodies, immunity and anaphylaxis. These phenomena are present in all cases of intestinal toxemia and the application of the underlying principals to therapeusis has given satisfactory results.

Danysz (13) in his classification of infectious diseases says: "From the point of view of their evolution, all infectious diseases have a common characteristic, the formation of antibodies in excess under the action of antigens." He divides diseases into two classes, one in which the compounds formed by the antibodies in excess with their antigens are soluble and neutral, the other insoluble and pathogenic. In the first type, as in the septicemias, the antigens confer immunity and also anaphylaxis. It is in this second group that the infection under discussion in this paper, apparently belongs. It has been asserted that the improvement in intestinal toxemic cases is due to beneficent mutation in the intestinal flora. Danysz has studied the intestinal flora before and after treatment with enteroantigens, and has found no such change. Our own experience is corroborative of this. The change, therefore, is probably in the cells of the body organism. This conclusion is based upon a prolonged study of over five hundred cases of colon disease that have been treated by enteroantigens or autogenous vaccines obtained from the bacteria derived from the intestinal tract and of which the following history is typical.

Case II.—M. K., male, cartoonist, aged thirty-nine, married, first seen in October, 1914. He had been rejected by army officials for chronic bronchitis. He had been constipated all his life, and suffered from nervousness and flatulence. He had had several attacks of socalled ptomaine poisoning, with abdominal cramps, and pain in the back; his memory was poor and eyesight blurred. Mineral oil produced bowel movements but gave no permanent relief. Constipation was rectal and sigmoid with tight sphincter. The patient was placed on a diet of agar and bran; rectal dilators were used, with Bacillus bulgaricus cultures, salol, abdominal massage, and vibration. Twelve months' treatment showed only slight improvement. Autogenous colon antigen was begun and given every four days for four months. The results were excellent, mentally and physically, and were permanent to date.

The following history records the extremely severe nervous and mental phenomena due to advanced intestinal toxemia and the marked anaphylaxis after the administration of enteroantigen.

Case III.—Mrs. B., had had intestinal toxemia for years, with profound depression amounting to insanity for two years. The urine was saturated with indican and she was mentally incompetent. The colon was kinked and diseased. Right sided resection was performed by Draper after which the patient's mental and physical condition became worse with delirium and coma, severe albuminuria with all kinds of casts. For a week her death was hourly expected. Autogenous colon vaccines were given, followed by severe reactions, increased delirium, restlessness, and the patient had to be restrained in bed. These reactions lasted for from eight to twelve hours and were followed by a period of calm and general improvement and a diminution of the indican, albumin and casts. Antigens were administered every four days for a month and a half, after which they were discontinued, the patient leaving the hospital weak, but in good mental condition. It was then for the first time that I obtained an intelligible connected history from her. Two years after the operation she was in good physical and mental condition.

Of utmost importance in all these cases is the presence of mixed infection where numerous foci of infection exist, as in the teeth and maxillæ, tonsils, sinuses, rectum, cervix uteri, appendix and seminal vesicles. These mixed infections may be responsible for the severe anaphylaxis that occurs during antigen therapy and it is significant that anaphylaxis may become very severe when antigen is administered during operative dental procedures. It is therefore important to remove all obvious foci of infection.

When colectomy is necessary a previous course in enteroantigen or serum is advisable as the immunity thus produced has been demonstrated in our operative cases to have decided value in preventing perforations, in hastening the healing of the intestinal anastomosis, and in promoting recovery.

Evolution in the course of these researches is gradually leading to a simplified therapy and the development of a valuable stock serum. This serum has been prepared under the direction of Dr. J. F. Anderson (14) from the different strains of colon bacilli and streptococci obtained from the mesenteric glands at operation among Cotton's patients in the State Hospital at Trenton, N. J. The serum is experimental and not yet on the market. It has been described by Anderson (14) and its effect by Draper (15).

PREPARATION AND DOSE OF THE ANTIGEN.

Since the cecocolon is the principal local seat of the disease as proved by operative and clinical experience, the active and virulent bacteria are found in this region. Cultures obtained from the cecocolonic contents or from mesenteric glands are most direct but feasible at operation only. Cultures usually are taken from the feces following active catharsis, preferably after a large dose of castor oil. The first stool is discarded and the second or third stool used for the culture. These cultures are planted on agar-agar from which an abundant growth, at least of the colon organisms, is obtained in twenty-four hours. Antigens are prepared from all types of organisms recovered and labelled with the variety and number to one c. c. for the sake of uniformity. The initial dose is usually ten to twenty-five million bacteria and the limit three hundred million. In particularly sensitive individuals or in those with a marked degree of toxemia, the initial dose should be small, as low as ten million colon bacilli. The frequency of the dose is usually every four days, the average time of early immunity. This time has been estimated through clinical experience and is the same period recommended by Danysz in his administration of enteroantigens.

Anaphylaxis results from excess of antibodies under the action of the antigen and is commonly termed a reaction. This may be local or general. A general anaphylaxis or reaction consists often of an exaggeration of the patient's symptoms. Usually there are headache, malaise, and neuralgic pains, general or localized if some particular focus of infection is present. Abdominal cramps frequently localized in the cecocolon followed by increased intestinal peristalsis may occur. In some instances of marked constipation a complete evacuation of the bowels takes place. These reactions are often of great diagnostic value. They may develop from six to twenty-four hours after the injection or occasionally later. It is rare for anaphylaxis to occur after every injection unless excessive doses of the antigen are given.

The dose must be watched carefully and the amount kept below the anaphylactic point. A patient with ulcerative colitis who had been taking the antigen herself manifested acute symptoms from an overdose. She was found in a state of collapse, with a temperature of 104°, vomiting and diarrhea. She informed me that she had taken a billion and a half of the bacteria (colon antigen) and had had a similar experience the week before but had not informed me of it, fearing the vaccine would be discontinued. She had marked colon disease, for which an operation was urgently needed and was excessively toxic. Small doses of colon antigen had given considerable relief, but an overdose proved nearly fatal. The duration of treatment varies in each case and depends upon the clinical results. After about seven doses, the interval may be gradually lengthened as immunity progresses. In cases of partial obstruction, as from bands, where operation has been refused or was inadvisable, antigen may be needed for a period of years. The beneficial results of the antigen are most marked on the nervous system. Mental relief is sometimes immediate and sensory phenomena, neuralgia, myalgia, and neuritis, are often completely relieved. The cessation of sciatica due to colon bacillus toxemia is most spectacular.

DIAGNOSIS.

The history of the toxemic patient is paramount; x ray, physical signs and clinical laboratory findings, following in order of importance. Constipation especially should be given a careful detailed consideration, several small stools a day often being characteristic of incomplete evacuation of the colon. Constipation from infancy is suggestive of sigmoid disease and the history should be carefully analyzed for appendicitis and for anomalous membranes. Many appendices have been removed on short notice and often unnecessarily. Taylor (16), in his important paper already referred to, reports twenty-six per cent. of appendectomies with no benefit, and our own records show twenty-five per cent. (17). Sensations of drag with nerve tire and inefficiency are characteristic symptoms. Flatulence is also a characteristic symptom and if gas is passed with difficulty per rectum, chronic partial obstruction should be suspected.

A reliable record of prolonged anticonstipation diet may save valuable time in the decision on operative procedures. Hemorrhoids or fissures of long standing alone may be the cause of the gastrointestinal symptomatology, so rectal investigation is essential. The mouth record, especially of all dental work and extractions, should be carefully noted, as teeth and jaw infections may cause as much gastrointestinal disturbance as rectal disease. Elimination of pathology at the ends of the alimentary canal may clear up symptoms throughout the canal itself.

Nervous and mental disturbances are the most frequent and often the earliest indications of gastrointestinal disorders. When these symptoms are profound and caused by recognized lesions in the gastrointestinal tract immediate surgical intervention should be seriously considered. Frequently, however, as cited, relief in these cases is afforded by the removal of focal infections in the accessible regions.

A thorough survey of the individual is imperatively indicated. This can be accomplished only through the closest possible cooperation between the diagnostician and therapeutist.

CONCLUSIONS.

1. Chronic intestinal toxemia is a definite entity and is the primary cause of the protean symptoms characteristic of chronic intestinal disease.
2. It has a triple origin, by far the most important being the infection of the gut wall.
3. Pathological findings and studies in immunity point strongly to a focal infection in the gut wall.
4. Therapeusis consists in removal of all accessible foci of infection and the treatment of the bowel focus by enteroantigens. These failing, the radical operation of colectomy may in special cases be indicated.

I desire to express my appreciation of the assistance and sympathetic cooperation of all the group interested in this study, without which advance would be impossible. These men are Dr. John W. Draper, Dr. Henry A. Cotton, Dr. John F. Anderson, Dr. Edward S. Pope, Dr. Bertram Ball, Dr. F. S. Fisher, and Dr. Frederick W. Smith.

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Intestinal Infections and Toxemias and Their Biological Treatment*

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The relation of foci of infection to systemic disease is an accepted fact. There has been too much localization of thought upon a limited number of organs and tissues, namely the teeth, tonsils or sinuses. There has been a great deal of discussion as to whether it was the teeth, the tonsils or the sinuses that produced a given disease. The tendency has been to believe that the teeth or tonsils are the cause of all general toxic manifestations of foci. Others advanced the idea that constipation or autointoxication was the main cause of disease.

The fundamental principle is well founded upon careful clinical and experimental observations, but inadequately applied in some instances, because of the failure to recognize the relationship of one focus of infection to another throughout the digestive tract.

Many diseases have been attributed to the more evident infected areas of the upper digestive and respiratory tracts, unmindful of the extensive amount of hidden areas in the intestines equally well suited and susceptible for the harboring of pyogenic bacteria. We have designated these obscure infections as occult foci of infection (1).

OCCULT FOCI OF INFECTION.

The teeth, tonsils and sinuses are more accessible to examination than are the gallbladder, pancreas, duodenum, appendix, colon, and rectum. In spite of their accessibility, the teeth, tonsils, and sinuses are often neglected. It is therefore obvious why the hidden structures suffer an even greater neglect. It is not surprising that syndromes are unrelieved by the removal of the evident foci when one recognizes the possibility of the occurrence of occult foci in the lower digestive tract. The extensive amount of mucoid, lymphatic and glandular tissues of the intestinal tract, which is constantly exposed to infection, certainly merits a careful and searching consideration which, hitherto, has not been universally accorded to the intestinal tract.

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Moreover, there appears to be an intimate relationship between infections of the upper and of the lower digestive tracts. We have been able to demonstrate the presence in the feces of pyogenic organisms similar to those previously obtained from dental and tonsillar foci in the same case. To obtain these cultures it is necessary to drain the colon freely in order that the true nature of the intestinal flora may be appraised. It is known that the bacterial flora diminishes in viability as it approaches the rectum because of the lack of moisture, excess of bacterial toxins, and the formation of autolytic substances. Cultures obtained from a freely drained colon and grown upon a double strength meat infusion carbohydrate-broth for four hours and then placed upon blood agar plates will reveal, in many instances, pyogenic cocci not obtainable from a constipated stool (2). Stool specimens obtained by this technic furnish direct evidence of the character of the intestinal flora. The intestinal flora of a healthy baby or child, not overfed with proteins, presents a striking contrast to the flora of an adult on a mixed diet and more so to the flora of an adult suffering from one of the chronic forms of disease. It has been our observation that a complex fecal flora is almost invariably associated with either dental, tonsillar, respiratory or gallbladder infections and these infections are almost universally associated with, or the cause of the majority of, systemic diseases. It appears that galltract infection, with or without stone formation; pancreatitis, acute or chronic; appendicitis, acute or chronic; hemorrhoids and fistulæ, are only localized structural manifestations of intestinal infections. Repairing or removing this pathology by surgical intervention frequently improves the condition but does not essentially benefit the intestinal infection, or the individual. It is too often a clinical observation that galltract, pancreatic, duodenal, appendiceal and hemorrhoidal bloodvessel infections are simply temporarily relieved by surgical measures, after which the focus of infection breaks out in a new location; this is why so many people require and undergo one operation after another without relief (3). The neglect of intestinal infections is responsible for an unnecessary number of cholecystectomies, cholecystotomies, pancreatectomies, appendectomies, hemorrhoidectomies and peritoneal adhesions. Many of the acute fulmination inflammations of these tissues have their origin in a common source and are preventable, if one will consider the intestinal tract as a prolific source of infection and responsible for the acute occurrence of surgical conditions (4).

TYPES OF INTESTINAL TOXEMIA.

1. Putrefactive toxemia: a, indolic types with indicanuria; b, indolic types without indicanuria; c, butyric acid types with Bacillus aerogenes capsulatus infection.
2. Pyogenic infection toxemia.

The putrefactive types may or may not be associated with pyogenic infections; a combination of the two types, however, is frequent. In the indolic type of putrefactive toxemia, it has been our observation that there may or may not be an excessive indicanuria and for this reason we divide the indolic type into two classes, with and without indicanuria. The indolic type showing indicanuria is most usually associated with some degree of ileocecal valve incompetency, this defect allowing the regurgitation of cecal contents into the ileum. When this occurs, great numbers of bacteria are being thrown constantly into the lower part of the ileum from the cecum and the colon bacillus finds a fertile pabulum, relatively carbohydrate free, for its growth. On such a medium, the colon bacillus is an active and prolific indol former. This occurs in a portion of the small intestine where absorption is rapid and the cleavage processes of the liver are broken down by overwork which produces an excessive indicanuria, and in some cases acetonuria. We have clinical proof that this is true, for we have reduced the indicanuria by feeding to the patient a lactose or dextrine laden diet; these sugars, because of their slow absorption, are to be found in the ileum and colon, and their presence changes the colon bacillus from a putrefactive to a fermentative type. It has been demonstrated in the laboratory that the colon bacillus, when grown on a carbohydrate free medium, will produce indol, but the addition of a carbohydrate to the medium suppresses the indol forming characteristic. In the indolic type of putrefactive toxemia without indicanuria, the ileocecal valve is intact and diminishes the number of bacteria that pass upward into the ileum from the cecum and explains the relatively low indican index in some cases of manifest clinical autotoxemia. The fact that the liver may be active and able completely to destroy indol must be borne in mind in the indican free cases.

The butyric acid type of putrefactive toxemia is characterized by a gram positive flora predominated by sporulated and nonsporulated types of Bacillus aerogenes capsulatus which is an anaerobic, spore forming organism with hemolytic properties, capable of living on either a carbohydrate or protein residue. It is able to produce gas on either pabulum. As a rule, this bacillus, when the environment is favorable, practically destroys all the helpful organisms of the intestinal tract, that is, the aciduric forms and the colon bacillus. This organism is associated usually with pyogenic infection. In this type of toxemia, indican may be very scarce or absent, depending upon the fate of the colon bacillus. Great amounts of acids are produced, mostly butyric acid, with others of secondary importance, such as caproic, valeric and proprionic. At times, the fatty acids are neutralized by bases which are formed during the course of putrefaction, especially ammonia, which forms ammonium butyrate in excess. Ammonium butyrate is a distinct intestinal irritant and produces a diarrheal condition not infrequently observed in this type of infection. It seems logical to ascribe the occurrence of aerogenes capsulatus infection as part of the pathology of virulent pyogenic infection which thickens the intestinal mucosa and inhibits the normal interchange of gases between the intestinal cavity and the blood stream. When the colon is freely drained and the aciduric forms are established, the intestinal mucosa is given a chance to heal and the interchange of gases is increased. When this occurs, the absolute anaerobic condition of the colon is altered and the laboratory picture shows that the gas bacillus changes from the nonsporulated state to the sporulated, evidence of an unfavorable environment having been created. This type of infection is very hard to deal with, especially from a dietary point of view.

By pyogenic infections, we mean those due to the pyogenic cocci which we have found so frequently associated with one of the putrefactive forms of toxemia. The pyogenic foci form in the lymph follicles, Peyer's patches, lymph nodes, mesenteric nodes and intestinal mucosa. In fact, intestinal putrefaction so alters the protective secretions of the intestinal tract as to allow infection from the upper digestive tract to gain lodgment in the previously mentioned structures of the small intestine and the colon. For this statement we have pathological, bacteriological and clinical proof.

The pathological changes are usually hyperplasia of the intestinal chain of lymphatics far in excess of the hyperplasia found in lymphatics of the upper digestive tract. There is a diffuse infiltration of the intestinal mucosa with lymphocytes, eosinophiles, plasma cells and in some instances areas of polymorphonuclear infiltration forming small abscesses. In some instances cystic glands are noted. In the more chronic cases, the submucosa is fibrous and shows hyperplastic lymph follicles and diffuse infiltration of mononuclear cells as found in chronic appendicitis. Soon the muscular coat shows inflammatory infiltration with fibrosis and a loss of smooth musculature. The fibrosis causes a loss of elasticity of the intestinal wall which results in intermittent dilatation of the intestines, produced by constipation, which in turn finally produces a chronic dilatation and thinning of the colon wall. Finally, the inflammation extends to the serosa where it produces adhesions and the drainage of the infective substances to the spleen and liver causes fibrosis.

Bacteriological proof is found in the isolation of bacteria from specimens obtained from a freely drained colon and in autopsy cultures of mesenteric nodes. In numerous instances we have noted in the intestinal contents bacteria identical to those found in the teeth and tonsils.

Clinically, intestinal infection produces or is associated with a multitude of disorders and diseases. The more common types of diseases associated with infection of the digestive tract are: cardiovascular renal conditions; arterial disease; abnormal blood pressures; the rheumatisms; some forms of eczema; some forms of asthma; some indefinite disorders such as the socalled neurasthenic and psychasthenic states; neuritis; some forms of neuralgia; malnutritional states; autointoxication syndromes; postinfluenzal asthenias; some forms of obesity; diabetes; intestinal stasis and constipation; subacute or chronic appendicitis; iritis; malconvalescent states, either from acute diseases or operation or pregnancies; chronic galltract disease; intestinal ulcers; hemorrhoids; syndromes characteristic of visceroptosis; mucous colitis and the various indefinite digestive disorders (5).

RESTORING THE BIOLOGICAL FUNCTION OF THE LOWER DIGESTIVE TRACT.

The restoration of the biological function of the lower digestive tract presupposes the removal or correction of foci of infection in the upper tract. Infections of the gallbladder have recently been studied by Lyon (6-7). Our experience in gallbladder infections has led us to believe that free drainage of the colon will indirectly drain the gallbladder, by hastening the activities of the small intestine. In a few cases, this obviates the intraduodenal method, and accomplishes in one operation not alone a gallbladder drainage but also a colon drainage. There is no attempt to minimize the importance of duodenobiliary drainage, as this procedure furnishes direct evidence for a correct diagnosis and is useful as a therapeutic measure, which bids fair to rob surgery of its ofttimes inadequate method of dealing with these infections. Duodenobiliary drainage should always be combined with colon drainage whenever the gallbladder infection is not relieved by colon drainage, this statement being based upon the constant association of gallbladder infections with colon infections.

The treatment of pyogenic infections and putrefactive toxemias of the lower digestive tract is divided into five parts: 1, nonsurgical mechanical drainage of the colon, or gallbladder, or both; 2, the changing of the biological processes by rectal and oral implantation of the protective forms of bacteria; 3, maintaining a permanent normal bacterial flora by diet; 4, autogenous vaccines in selected cases, and 5, exercises and postures.

The nonsurgical mechanical drainage of the colon drains this structure of its fecal contents, numerically diminishes the pyogenic types; removes the pabulum of the harmful organisms; washes out toxic secretions and creates an environment unfavorable to the perpetuation of the harmful strains of microorganisms and favorable to the helpful forms of microorganisms.

The biological processes of the colon are changed by the numerical diminution of the putrefactive and pyogenic bacteria by mechanical drainage as just previously stated. The patient is fed on a lactose laden diet, given Bacillus acidophilus by mouth, given rectal implants of lactose and Bacillus acidophilus, and in some instances, when the need of it is shown by cultures, nontoxic strains of colon bacillus. A normal and beneficial flora is obtained by this method, in from three to five days, and is maintained by proper dietary regimen.

In the evolution of our work we have increasingly tended to favor the Bacillus acidophilus and the colon bacillus. Formerly we used a mixed culture of bulgaricus and acidophilus but our own observations as well as those of Kendall (8-10), Rettger (11-12), Rettger and Cheplin, and Rettger and Hull (13-14), have proved conclusively that the bulgaricus cannot be grown permanently in the human intestine. Therefore, intestinal colonization must follow along natural lines. The Bacillus bulgaricus is essentially a milk parasite, and it is irrational to attempt to accomplish with an unacclimatimized bacterium that which is so easily done with the implantation of an acclimatimized bacterium like the acidophilus.

We have further found that strains of the acidophilus freshly isolated from infants' stools give prompter results than those grown for generation to generation on laboratory media. In other words, acidophile bacteria freshly isolated from a competitive environment are better than those grown in a noncompetitive environment (15).

The colon bacillus, according to Herter (16), is an organism which may be useful or harmful, depending upon its microorganic environment and the dietary residue upon which it subsists. In other words, a colon bacillus is like a mental defective —potentially good under proper supervision but potentially harmful under unfavorable circumstances.

Our observations have led us to believe that there are very few cases in which the colon bacillus is absent in the fecal contents of a drained colon and the problem is not so much the implantation of the colon bacillus as the reformation of its biological activities which is accomplished by the lactose laden diet. Observations have shown that the colon bacillus flourishes in association with an acidophile flora, in fact, the acidophile flora seems not only to reform it but to stimulate its growth. For this reason we do not routinely implant colon bacilli unless cultures of the fecal contents of the drained stool show their absence, which is rare.

It is possible to simplify rapidly the complex nature of the fecal flora of man in from three to five days and to maintain this simplification after there has been a sufficient change of the biological processes in the intestinal flora to permit of the acidophile dominance in association with proper dietary measures. It must be understood that, upon the suppression of the acidophile types, the putrefactive and pyogenic types become the dominant types and become entrenched in the crypts of the intestinal mucosa, and in many instances in the lymph nodes and the mesenteric lymph system. The harmful bacteria become then more or less permanently established so that their dislodgment is not necessarily accomplished by a simplification of the intestinal flora over a few days, but it requires months of fecal flora simplification in order to change the biochemical environment, so that it is inimical to the growth of the putrefactive and pyogenic forms, not alone in the intestinal canal, but also in the intestinal tissues.

From what has been said, one should not expect Bacillus acidophilus to accomplish more than one thing, that is, the simplification of the intestinal flora, and this can be accomplished successfully only by a removal of foci of infection from the upper digestive and respiratory tracts, and an adherence to proper diet.

In selected cases we believe in autogenous vaccines prepared from the teeth, tonsils and feces. This is especially true in long standing cases where there is reason to believe that involvement of the mesenteric lymphatics has occurred, or in cases with an apparently lowered resistance to infection. Even nonspecific vaccine stimulation acts in many instances as a tonic and seems to hasten recovery. Vaccines are particularly indicated when streptococci and staphylococci are isolated in large numbers from the stool. Vaccines have been of tremendous value in asthmatics when the asthma was due to intestinal infection and protein sensitization had been eliminated. Vaccines must be given over a long period of time, many cases have shown no results from a few doses of vaccines but by the continued use of large doses beneficial results have been obtained.

The success of acidophilus therapy is dependent upon the observance of a number of minute details which may appear as unnecessary or unessential to one unacquainted with intestinal bacteriology. Whenever results are disappointing it is practically always found that the cause is not with the therapeutic principle but because it has been administered under improper conditions or incorrectly used.

After experimenting for some time we have been able to produce a milk that is white in color, of a nonlumpy consistency and its richness may be varied to fit individual requirements. The taste can be made sourish or sweetish without altering the bacterial count. This milk is not better than that prepared by Rettger's technic, but we find it more acceptable to the rank and file of patients. The technic for its preparation is as follows: One pint of water is placed in a litre flask. If it is desired that the milk have a neutral or slightly sweetish taste a teaspoon or two of lactose is added to the water. It is then autoclaved for twenty minutes under twenty-five pounds of pressure. It is then cooled. A pint tin of unskimmed, unsweetened evaporated milk is opened and poured into the flask, the contents of the flask are inoculated with a pure strain of Bacillus acidophilus. Strict laboratory technic is observed throughout the procedure. Incubate for twenty-four hours at 99° F. A curd will form which is very soft, white in color, and there is a slight separation of the whey from the curd at the top. Shake the flask to break the curd and it is ready for use. By adhering to this technic the milk will approach uniformity in color, odor, consistency, bacterial count, taste, viability and purity of culture and these features facilitate the approximation of an average daily dose which is very desirable.

The commercial tablets and capsules of Bacillus acidophilus, on account of insufficient doses, are makeshifts. The liquid culture of Bacillus acidophilus, used in sufficient doses and fortified with lactose, is as effective as the milk, but not so palatable.

Bacillus acidophilus is not a cureall. It will perform but one therapeutic function, the simplification of the intestinal flora, if certain other circumstances are favorable and facilitate the performance of this one function.

Bacillus acidophilus milk constitutes a means of giving enormous acidophilus doses in a palatable form. It constitutes a food product as well as a therapeutic beverage. It is given in quart quantities, daily, until the differential bacterial count of the fecal smears shows a sixty-five per cent. or seventy per cent. acidophile domination.

SUMMARY.

The treatment of intestinal infections is predicated upon five salient factors: 1, The removal of foci of infection from the upper digestive and respiratory tract; 2, the efficient nonsurgical mechanical drainage of the colon; 3, sufficient doses of pure cultures of viable strains of Bacillus acidophilus; 4, the maintenance of a protective intestinal flora by diet; 5, autogenous vaccines in selected cases. This routine seems to offer a direct avenue of approach not alone for diagnostic purposes but also for therapeutic purposes in many diseases of obscure etiology.

References will appear in the author's reprints

Some Observations on the Incidence of Pain in the Upper Left Quadrant of the Abdomen*

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While much study has always been directed to lesions in the upper right quadrant of the abdomen, but comparatively little attention has been paid to lesions in the upper left quadrant. The following cases have recently directed our attention to distress in this region of the abdomen.

Case I.—On November 1, 1920, William F., aged twenty-six years, was brought to the Mercy Hospital in the patrol at three o'clock in the morning, complaining of very acute pain in the upper left quadrant of the abdomen. His past history was negative, except for an attack of influenza in 1918. The patient had been complaining for two weeks of continuous pain in the left hypochondrium. The pain would frequently be aggravated by the ingestion of food, and on this account, he had been living on a milk diet, for the past ten days. The night previous to the attack, the patient had eaten a large dinner, and at two in the morning was awakened with an intense pain in the left hypochondrium.

The patient was a young man lying with legs drawn up obviously in great abdominal discomfort. The heart and lungs were negative. In the upper left quadrant of the abdomen in the splenic area there was extreme and localized tenderness on palpation which was not present in any other portion of the abdomen; no masses were revealed. The patient narrowly escaped the operating table, as it was felt that he was affected with a localized peritonitis of unknown origin. He was treated conservatively, however, until the following morning, when he himself volunteered the information that he had passed a large tapeworm a week previously. An ethereal extract of male fern was promptly administered, and on the third day he discharged a large taenia saginata including the head.

Subsequent gastrointestinal examinations including an x ray investigation and gastric analysis revealed normal conditions. The patient's course throughout was afebrile, and he was discharged at the end of three weeks in excellent condition, and without discomfort.

Case II.—A young man, William M., aged twenty-five years, a native of South Carolina. His complaint was gastric discomfort, and pain in the left upper quadrant. His family history was unimportant. The patient had had influenza two years previous to admission; chancre several years ago, at which time he was under the impression that there was present an associated gonorrhea. An appendectomy had been performed one year ago.

About eighteen months previously, the patient was seized with nausea, vomiting and pain at varying periods after meals; the pains being more intense at night, and relieved by the ingestion of warm milk; violent headaches occurred with these attacks.

Examination revealed a rather emaciated youth with normal heart and lungs. The abdomen was soft, and a slight tenderness was observed over the region of the pylorus, as well as in the upper left quadrant. The spleen was not palpable. The gastric analysis presented a free hydrochloric content of twenty-six, total acidity of forty-six after an Ewald test breakfast. The stools were negative for occult blood. Large quantities of mucous were constantly found in the feces. The blood examination was as follows: red blood corpuscles, 3,800,000; white blood corpuscles, 21,000; differential count, normal; no eosinophiles; Wassermann, negative. The x ray examination revealed a definite defect at the pyloroduodenal junction, together with a marked enteroptosis.

At that time a diagnosis of gastric ulcer with enteroptosis was made, and the patient placed upon a Sippy treatment. He ran a perfectly normal course for two weeks, when suddenly he began to complain of an intense griping pain in the left upper quadrant. This was quite localized and exquisitely tender to pressure. A profuse diarrhea set in and the stools at this time revealed numerous entameba. A number of courses of emetin were administered and the bowels irrigated daily with quinine and silver nitrate solution. The case was stubborn, but after vigorous treatment the ameba disappeared from the stools and proctoscopic examination revealed the ulcers had healed three months later. During this period the patient continued to complain of pain in the splenic area. However at no time was the spleen palpable. The pain was so intense that the patient would scream out at any hour of the day or night, requiring the use of opiates and hot baths.

Wassermann tests at this period were repeatedly negative. Ureteral catheterization was resorted to, and revealed normal condition on both sides. X ray plates of the kidneys were negative. A bismuth enema of the bowel was also negative, with the exception of the finding of spasticity of the bowel.

The patient was discharged fourteen weeks after admission in fairly good condition and no definite diagnosis could be made as to the cause of the left upper quadrant pain.

Our impression was that it most probably bore some relation to the amebic dysentery, either in the form of ulceration or adhesions in this region; or is it possible that a simple mucous colitis might have been the cause? Nothing was discovered which would conclusively explain it, and no form of therapy seemed to relieve it.

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CASE III.—Miss B. aged seventeen years, was admitted January 13, 1921, complaining of acute pain and tenderness in the splenic area. Her previous history was unimportant, except that she had had a double herniotomy performed eight months previously. She had had frequent attacks of acute indigestion, even antedating the hernia operation. On January 1st she was taken with an acute attack of pain, requiring a hypodermic injection of morphine for relief, and one week later diarrhea and vomiting developed lasting a day. Two days ago a fullness in the left side of the abdomen was noted. The pain became intense, and localized itself in the left upper quadrant. It would disappear at times, and frequently returned following meals, though on occasions the same distress would manifest itself in the middle of the night. The bowels moved normally and regularly and there was no pain in any other region of the abdomen. The patient had lost fifteen pounds in weight during the last two years, which she attributed to her rigid diet. No special form of food would induce an attack with the exception of corn. Since the onset of the present attack she had limited her food to liquids.

On examination, the patient a young girl, pale in appearance, was found lying in bed in obvious discomfort. Her heart and lungs were normal. On examination of the abdomen one observed a smooth round tumor in the left hypochondrium presenting no signs of fluctuation and descending slightly in inspiration. The flank was not rounded but an impulse was transmitted to the hypochondrial region on bimanual palpation. The abdomen elsewhere was negative. The temperature at the time of admission was normal, but rose to 101° F. two days after, with a corresponding increase in the pulse rate, and remained at this level until the time of operation.

A catheterized specimen of urine was found amber in color, alkaline in reaction, of a specific gravity of 1015, containing a slight trace of albumin, a few epithelial cells, a few white blood cells, an occasional red blood cell and amorphous phosphates.

Three subsequent urinary examinations up to the time of operation revealed the same picture. A gastric analysis after an Ewald test meal presented a total acidity of 10, free hydrochloric acid 5; no lactic acid. The stools were negative for occult blood on repeated examination. The blood was negative for malarial parasites. Red blood cells numbered 4,800,000, white blood cells 12,850. Differential count, neutrophiles 55 per cent., small mononuclears 35 per cent., large mononuclears 5 per cent., transitional 5 per cent.

A fluoroscopic examination of the gastrointestinal tract revealed a very large stomach, prolapsed and atonic with a large six hour retention and a marked deformity in the centre of the greater curvature. The duodenal cap was normal. The plates presented a similar condition with an area of lessened density of the stomach shadow in the centre of the stomach. The x ray examination suggested pressure from without by a tumor. Previous to the x ray examination we believed we were dealing with an old perforated gastric ulcer surrounded with dense adhesions. While the mass in the hypochondriac region detected on bimanual palpation was still held under consideration, the negative urinary findings as well as lack of renal symptoms left a doubt as to whether it was playing an important part in the patient's present condition.

A thorough cystoscopic and urethral catheterization was performed. The bladder examination was negative. The catheter entered the left ureter passing in without meeting any obstruction to the kidney pelvis. The functional kidney test for one hour and ten minutes revealed practically no output on the left side; 40 per cent. functioning on the right side. Twenty c. c. of a sodium iodide twelve and one half per cent. solution were now injected in the left kidney, and another x ray examination made which revealed a dilated ureter, beginning at the transverse process of the 5th lumbar vertebra, with a large kidney with narrowing of the ureter below, hydronephosis, and two cystic areas in the kidney substance. Operation was performed January 24, 1921, by Dr. Alexius McGlannan when a large hydronephrotic kidney was excised. The patient made an uneventful recovery.

A subsequent investigation into the records of this hospital revealed the following findings. An attempt was made to tabulate all those cases in which upper left quadrant pain might conceivably occur. As splenic hypertrophy is generally regarded as being a common cause of left hypochondriac pain, many cases in which this organ was palpable were noted.

In the 1,134 cases tabulated the spleen was found palpable in seventy-eight or sixty-eight per cent, tender in twenty-two or one per cent and in 107 or eight per cent. there was discomfort or pain in the upper left quadrant. When it is borne in mind that only those cases were tabulated where upper left quadrant pain might conceivably occur, the number associated with pain is evidently small.

The pain in this series varied from a slight discomfort to a severe distress; was constant in some instances, and intermittent in others, and would occur synchronously in some instances with pain in other regions of the abdomen and in a number of instances was referred from lesions in distant organs of the abdomen as the gallbladder right kidney or appendix. It is also interesting to observe that while the spleen was palpable in seventy-eight instances or 6.8 per cent., it was only tender to pressure in twenty-two or one per cent. of cases, indicating that a splenic hypertrophy need not necessarily be a cause of splenic or left upper quadrant pain.

Of the 1,134 cases 107 or eight per cent. only were accompanied by discomfort and pain in the upper left quadrant. Of these, in one instance was the pain due to Hodgkin's disease; in three to enlargement of the spleen in Banti's disease; in two to ulcerations in amebic dysentery; in one to tapeworm disease; in two to pancreatic cysts; in six to carcinoma of the pancreas; in one to cirrhosis of the liver; in two to referred pain from cholelithiasis; in one to an acute appendicitis; in two to chronic appendicitis; in two to intestinal obstruction; in five to mucous colitis; in one to localized traumatic peritonitis; in one to tuberculous peritonitis; in six to chronic constipation; in three to peptic ulcer; in four to gastric cancer; in two to a general carcinomatosis; in three to cancer of the splenic flexure; in three to cancer of the sigmoid; in three to hydronephrosis; in four to pyelitis; in two to tuberculosis of the kidneys; in five to kidney stone; in three to Deitl's crises; in three to nephroptosis on the left side; in eight to salpingitis; in four to carcinoma of the uterus; in two to extrauterine pregnancy; in two to ovarian cysts; in five to lobar pneumonia; in seven to pleurisy; in one to spondylitis; in four to Pott's disease; in one to congenital hemolytic jaundice; in two to intercostal neuralgia.

An attempt was made to correlate our autopsy findings in a series of forty cases with the symptoms found during life. There were eight cases in which specific mention of splenic lesions was made. These are as follows:

Clinical Diagnosis.	*Pathological Report.*
Cerebral hemorrhage.	Splenic infarct.
Tuberculous peritonitis	Tuberculous splenitis with spleen adherent to diaphragm.
Aortic regurgitation and chronic parenchymatous nephritis.	Spleen weighs 83 grams surface, pale color, capsule shows scattered areas of chronic peri-splenitis, cuts with resistance.
Pericarditis and endocarditis patient was one year old.	Spleen dark blue, firm consistency, circular in outline, multiple emboli.
Tuberculous peritonitis.	Spleen drawn back to vertebral column, many caseous nodules present. Spleen weighs 136 grams. Splenic pulp dark red and soft.
General Carcinomatosis	Few splenic adhesions.
Chronic interstitial nephritis and myocarditis.	Adhesions between spleen and omentum. Infarcts on surface; weight 500 grams.

Unfortunately in Case I the patient, an old man, was admitted in coma, and it was impossible to learn whether the patient had had pain in this region.

This series is of course small, but in no instance can we find a record of left hypochondriac distress, which again points to the fact that disease of the spleen need not be and is usually not accompanied by pain in this region of the abdomen.

CONCLUSIONS.

From our observations of the 1,134 cases in which attempt was made to tabulate only those cases in which upper left quadrant pain might conceivably occur, we believe the following conclusions may safely be drawn.

1. That splenic hypertrophy was comparatively rare and only in a small number of cases (one per cent.) was it the cause of upper left quadrant pain.

2. That of this group but eight per cent. were accompanied with discomfort or pain in the upper left quadrant revealing the fact, that pain was a rather rare occurrence in this region of the abdomen, and that this area was usually comparatively free of organic disease.

3. The character of pain varied from a slight discomfort to a severe distress; was constant or intermittent, and frequently occurred coincidently with pain in other regions of the abdomen.

4. Finally the pain noted in the upper left quadrant of the abdomen may originate from lesions in various organs. It was most commonly produced by affections of the left kidney (twenty cases); of the colon (nineteen cases), less frequently of the female generative organs (sixteen cases), of the pancreas (eight cases) and of the spleen (fourteen).

Disease.	*Number of cases.*	*Spleen palpable.*	*Spleen tender.*	*Pain or discomfort in upper left quadrant.*	*Remarks.*
Malaria	8	4	0	0	One case of tenderness in lower left quadrant.
Lymphatic leucemia	2	1	0	0	....
Hodgkin's disease	3	0	0	1	....
Pernicious anemia	5	1	1	0	....
Banti's disease.	3	3	3	3	....
Lead poisoning.	3	0	0	0	....
Typhoid	51	29	4	0	....
Abscess of spleen......	1	0	1	0	Onset with pain in stomach after meals, signs of resistance in left hypochondrium and indefinite mass in this region.
Hypertrophied spleen (unknown cause).	2	2	0	0	....
Influenza	25	2	0	0	....
Enteroptosis ...	78	0	1	0	....
Amebic dysentery	25	3	2	2	....
Hookworm	1	0	0	0	General abdominal tenderness.
Tænia saginata.	4	1	1	1	....
Ascaris lumbricoides ..	3	0	0	0	....
Cyst of the pancreas	3	0	0	2	Frequently associated with upper left quadrant pain; often increased on exertion and disappearing on stooping; frequently radiating toward left shoulder blade.
Acute splenitis.	1	1	1	0	General abdominal tenderness.
Hepatic cirrhosis	9	5	1	1	Painful spleen.
Cholelithiasis ..	54	1	1	2	Pain almost constantly in upper left quadrant.
Acute appendicitis ...	65	4	0	1	Appendix found ruptured with localized tenderness and pain in upper left quadrant.
Chronic appendicitis ...	86	3	1	2	Pain frequently referred to upper left quadrant but not localized.
Intestinal obstruction ...	21	0	0	2	Pain constantly in upper left quadrant.
Mucous colitis..	36	1	1	5	In five instances pain most frequently in left upper quadrant.
Acute peritonitis	34	0	0	0	....
Localized peritonitis	3	0	0	1	Due to trauma.
Tuberculous peritonitis	5	0	0	1	In this instance pain was constantly in upper left quadrant.
Constipation ...	39	1	0	6	....
Peptic ulcer....	90	0	0	3	Tender area and pain localized in this area.
Gastric cancer..	98	1	0	4	In four instances there was almost constant pain in this area in addition to the pain in other parts of the abdomen.
Carcinomatosis .	10	0	0	2	....
Cancer of colon	6	0	0	3	Cancer of splenic flexure.
Cancer of sigmoid....	4	0	0	3	Pain radiating from left lower quadrant upward.
Hydronephrosis.	8	0	0	3	....
Pyelitis	16	0	0	4	....
Tuberculosis of kidney	8	0	0	2	....
Kidney stone and stricture of ureter.....	30	0	0	5	....
Dictl's crisis....	11	1	0	3	....
Perinephritic abscess	4	0	0	0	Left-sided distress not localized.
Nephroptosis ...	11	0	0	3	Pain radiating from back into upper left quadrant. Tender on pressure.
Salpingitis	45	3	1	8	In many cases there was associated upper and lower left quadrant pain.
Carcinoma of uterus	18	1	1	4	Pain due to metastases.
Extrauterine pregnancy	4	0	0	2	.... Two cases with bilateral pain.
Cyst of ovary..	15	0	0	2	One case with sudden pain, especially during period in left upper quadrant operation. Dermoid cyst with twisted pedicle found.
Pneumonia	105	8	0	5	Pain increased in deep inspiration.
Pleurisy	42	0	0	7	Pain increased in deep inspiration.
Spondylitis	2	0	0	1	....
Pott's disease ..	17	0	0	4	Dorsal involvement.
Congenital hemolytic jaundice..	1	1	1	1	....
Intercostal neuralgia	9	0	0	2	Both of these cases associated with herpes zoster.
Total	1134	78	22	107	

The Preoperative and Postoperative Treatment of Colon Malignancy

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The internist and physiologist have combined and converted the practice of medicine from a combination of shotgun prescriptions and personality into a science. Until recently the surgeon has held aloof chiefly because of his general success and interest in the technical and bacteriological development of surgery. Cooperation of the surgeon, the internist, the bacteriologist and the physiologist is never so essential for success as in operations upon the colon for malignancy. In no other operative procedure within the abdomen does technical skill, a knowledge of local bacteriology and local and general physiology play so important a rôle in the operative result.

While there is little disturbance in the normal physiological balance of the body by the majority of surgical procedures there are the common elements of trauma in every operation, performed under general anesthesia, to which the patient is necessarily subjected. The fear of the knife, starvation period, general anesthetic, dehydration, exposure to infection and the manipulation of tissue disturb the normal balance and weaken the protective forces of the body. The extent of the disturbance in the normal balance of the body depends upon the degree of one or all the common elements of trauma and the additional traumata accompanying the given operation and the disease for which it is performed. Additional features for consideration in operations upon patients with carcinoma of the colon are: those relative to the disease such as the age of the individual, location of the tumor and degree of obstruction, toxemia and anemia; and those relative to the operation as the scope of the operation, whether it is palliative, preliminary or eradicating. As elimination of the disturbance in the normal balance of the body is impossible; the treatment must be directed toward providing and maintaining the normal requirements of the body under abnormal conditions.

Cancer of the colon is not distinguished from cancer in general by the age at which it occurs. However, there are two factors for consideration in the occurrence of cancer in general that are greatly emphasized by a tumor in the colon of a patient well past middle age; the primary effect upon the organ harboring the growth and the secondary effect upon the organism. From the deterioration of the other organs of excretion the colon is more likely to be called upon after the age of fifty than before, and it may be eliminated entirely as an excretory organ by the obstructing growth during the excretory crisis that often accompanies these operations, in the old. Complete obstruction of the colon by a growth at any age must be relieved by surgery without considering the effect the growth itself may have upon the length of life and the general condition of the patient.

The tumors of the right half of the colon may be classed as nonobstructing with the exception of those involving the ileocecal valve. The liquid content of this part of the colon permits of much greater encroachment upon the lumen of the bowel before signs of obstruction are manifest. These tumors usually grow out as they grow in, and as the symptoms of obstruction are delayed, many of them are inoperable from the viewpoint of regional metastasis before the attention is directed to the colon as the seat of the malignancy. While the diagnosis is difficult preparation of these patients for operation in one stage can be accomplished without recourse to any of the means of external drainage. The proper use of catharsis and colonic irrigation will cleanse the colon proximal to the growth and make operation in one stage a very safe procedure. Those involving the ileocecal valve produce symptoms of intestinal obstruction early and often cause an enormous dilitation of the ileum. Diagnosis in these cases is simple, preparation for operation in one stage cannot be carried out and some provision for external drainage of the ileum before anastomosis must be provided for, such as resection of the tumor and formation of an ileostomy with a secondary operation for anastomosis.

Cleansing the colon proximal to a tumor in the left half is a difficult procedure and it can only be accomplished thoroughly by establishing an artificial anus proximal to the tumor for external drainage and irrigation. As the tumor encroaches upon the lumen of the gut there is a decrease in the rate of flow of feces with an increase in absorption of fluid and the formation of scyballa, hard masses of feces that resist all forms of purgation. Acute obstruction in an intestine that has not been entirely occluded by the tumor often occurs when scyballa become lodged above the growth: the patient is exposed to the same danger from obstruction if an excision and anastomosis is performed before the scyballa have been removed. Removal of the scyballa and cleansing the colon of septic material is the most important step in the preparation of these patients for excision of the growth.

The degree of obstruction depends upon the location, extent, and character of the growth. In the majority of cases the diagnosis is made from the mechanical symptoms of obstruction and the stage at which these symptoms appear depends upon the consistency of the fecal current in that portion of intestine harboring the growth.

The general toxemia in patients with cancer of the colon is the result of absorption from the growth and from the colon. Marked cachexia is not the rule in patients with nonobstructing growths except in those cases with rupture and secondary infection with abscess formation. The toxemia of absorption from the colon may be either acute or chronic. The acute form is associated with complete intestinal obstruction and while it is not so rapid and overwhelming as the toxemia from obstruction and gangrene it is nevertheless severe and becomes fatal soon after absorption from the entire intestinal tract begins. The chronic form is the result of a partial obstruction or repeated complete obstruction from scyballa or foreign bodies that have been dislodged. Operation for removal of the growth in the presence of the toxemia of absorption from the colon is never justifiable.

Colonic stases and cancer in general are accompanied by secondary anemia but they do not cause sufficient changes in the blood to influence the surgical treatment of these conditions. The simple anemia of hemorrhage is manifested both by the blood changes and the history of severe hemorrhage from the bowel. There is another type of anemia in patients with a growth in the right half of the colon in which the blood changes are more like those found in pernicious anemia than in the simple secondary forms, and it cannot be attributed to colonic stasis nor the character of the growth as these tumors produce little obstruction and the same character of growth is found in all parts of the colon. While anemia is not often severe enough to preclude the possibility of immediate operation for removal it is always an advantage in preparing and operating upon these patients to keep in mind the blood changes. Increasing the interval between the primary and secondary operations will enable the patient to recover sufficiently from the simple anemia of hemorrhage, in the majority of cases, without blood transfusion. But those cases with changes in the blood resembling pernicious anemia are improved only by transfusion.

Patients upon whom palliative operations are proposed should have the same preliminary preparation as those with presumably removable growths, for with the thickness of the abdomen interposed it is impossible to say a tumor above the rectum is inoperable.

Preliminary operation in patients with acute intestinal obstruction should never be delayed for the preparation, but specimens of blood and urine should be taken and examined for the degree of toxemia and to detect the presence of complications such as diabetes, acidosis and nephritis and that proper postoperative treatment may not be delayed. Minutes count like hours in the treatment of these cases. Preliminary operation to explore the abdomen and to form an artificial anus for external drainage should receive a routine treatment since operation in these patients is never a simple matter.

Operation aimed at the complete removal of the diseased segment should never be performed before careful preliminary preparation and rarely in the presence of an existing toxemia and then only with provision for external drainage.

PRELIMINARY PREPARATION.

A discussion of operative treatment for carcinoma of the colon is incomplete when it omits the preliminary preparation of the colon and the general condition of the patient. The preliminary preparation is as important in every detail as any step in the operative period before or after the excision of the diseased segment. Neglect of these precautionary measures against shock, infection and fecal fistula is a wilful break in technic that may have more influence on the operative recovery than extensive soiling of the peritoneal cavity in a case properly prepared.

Improvement in the general condition of the patient is desirable, but from the very nature of the disease, marked gain in weight and strength cannot be expected. Treatment directed toward the general upbuilding, if continued for any length of time, may place the patient in the inoperable class even in what appears to be the early stage of the disease. After the diagnosis has been established and surgery selected as the method of treatment at least four days should be allowed for the immediate preparation for operation.

General measures are chiefly dietary. In all cases of carcinoma coming to the surgeon, there is an underlying tendency toward the development of acidosis following the shock to the internal metabolism of anesthesia and trauma. In prescribing the diet for colon cases foods with high carbohydrate content and little residue are chosen to make up not less than two thirds of the total. Protein, except that in coarse meats, is allowed. Fats are excluded in so far as possible. It is very important to keep the total caloric value of the food intake equal to or above normal requirements until the day of operation. This can be accomplished, meeting all other requirements, only by careful consideration of individual cases. To insure full food value, proper proportion and small residue, an estimated caloric value of the food intake should be recorded daily during the operative period. When this was carried out it was not uncommon to find patients taking half the required amount of food, when not under specific orders and without the interest of a nurse working with a definite end in view.

Fluid is essential and should be given in definite quantities up to the hour of operation. These patients get into the habit of taking small quantities of water as do other individuals suffering from chronic constipation and they require a great deal of encouragement to drink the required amount. The daily requirement for an average patient should be given by mouth and in addition, in dehydrated patients, the colon is given an opportunity to make up the body fluids by absorption from the frequent irrigations. Previous to the day of operation fluid up to 2,500 c. c. by mouth is sufficient and during the day of operation fluid is more essential than at any other time but it should be administered subcutaneously for the six hours immediately preceding operation to prevent overloading the colon with liquid feces. Patients with low hemoglobin, below fifty per cent., should not be overloaded with fluid just before operation as edema of the lungs is a frequent postoperative complication and careful administration of fluid is necessary for the thirty-six hours following operation.

Changes in the chemistry of the blood are frequent and they should be taken into account in planning the time for the operation and the scope of the operative procedure. An increase in the urea and creatinine content requires longer drainage and irrigation of the colon before operation for removal. A low carbon dioxide combining power of the blood can be corrected a short time after drainage has been instituted by the administration of alkalies. Alkalinization of a patient showing kidney changes, the presence of a high urea and creatinine, should always be a gradual process. Operation should never be done in a case with carbon dioxide combining power below 45 except for acute intestinal obstruction and in these cases early alkalinization is usually indicated but it is better to administer alkali by mouth than intravenously and run the risk of an acute suppression of urine, or an alkalosis.

Catharsis varies with the individual. Drastic purging is contraindicated in all cases, for by it the edema of the colon proximal to the growth is increased, the general condition of the patient is weakened and the taking of food interrupted. Preliminary operation in the presence of partial obstruction should never be preceded by a cathartic. For the routine case without evidence of obstruction a moderate dose of castor oil, saline or vegetable compound three to four days preceding operation with a daily laxative as milk of magnesia one ounce twice a day up to within thirty-six hours of operation will be all that is needed to cleanse the intestine. Catharsis during the last thirty-six hours before operation tends to produce a spastic colon during the operation, to cause painful contraction following operation and to dehydrate the patient.

In the local treatment of the colon two main indications are observed, viz., removing the contents of the colon, diminishing the septicity.

Cleansing the normal colon is quickly and easily accomplished by catharsis and irrigation. Operations of excision for nonobstructing conditions do not require elaborate preparation. However, in all cases of new growth of the colon, the results of chronic obstruction are present to a greater or less degree. The chief difficulty is in loosening and removing the scyballa which may resist all kinds of irrigation unless previously treated. To soften and release the desiccated fecal lining of the gut, six to ten ounces of oil are injected into the rectum. Six to eight hours later the rectum is emptied with a small soap suds enema, and after which the colon irrigated until the return is clear. The irrigating fluid need not be sterile, warm tap water with enough soda bicarbonate added to give an alkaline reaction makes the best solution for this purpose. This procedure is carried out daily until the day of operation. Then, instead of the oil injection, the colon should be irrigated twice during the twenty-four hours, the last not within four hours of operation to prevent leaving fluid in the colon.

In the normal colon the virulence of the bacterial organisms diminishes with the fluid consistency of the fecal current from the cecum to the rectum. With a growth in any part of the colon not only is the virulence of the organisms of the cecum increased but the whole of the colon proximal to the growth becomes a favorable breeding ground for virulent bacteria. Drainage of the colon proximal to the growth is the only means of reducing the virulence of the bacteria thereby diminishing the septicity of its contents. In all cases except the acutely obstructed, drainage of the colon proximal to the growth with irrigation through the rectum may be tried. In cases of complete obstruction, and in those in which drainage of the proximal colon cannot be effected through the rectum, preliminary external drainage by establishing an artificial anus becomes a necessity.

A postoperative routine cannot be planned to meet the needs of all patients, however similar the general indications may be. Therefore it is necessary to leave individual instructions for the postoperative handling of patients, and especially is this true after the resection has been performed. This discussion of postoperative treatment is for those cases having had resection of the tumor with or without anastamosis.

For the relief of the pain immediately following operation one sixth grain morphine plus one eighth grain p. r. n. for thirty-six to forty-eight hours is sufficient. No other narcotic will be necessary after forty-eight hours if the intestine above the anastomosis has been thoroughly emptied unless some complication arises. Colic which is not relieved by the rectal tube or an enema, accompanied by vomiting and a rise in pulse, is strongly suggestive of intestinal obstruction as peristalsis following resection does not cause pain in the absence of obstruction. If the anastomosis has been done in a normal intestine and the preparation has been complete there is no added danger from obstruction. Edema of the anastomosis may at times cause sufficient stenosis to produce painful peristalsis for forcing the contents through and into the distal colon. In a normal colon the edema from the trauma of anastomosis disappears in thirty-six to forty-eight hours but in those cases with an edema and distention of the proximal colon before anastomosis the reduction in edema may be delayed so it is always safer to provide for external drainage in such cases by means of cecostomy or enterostomy performed with a catheter. The pain in general peritonitis is more of a general distress throughout the abdomen, it is never absent and is the cause for bitter complaint on the part of the patient. It will have to be relieved by morphine. An ascending retroperitoneal infection causes no pain because of the loose attachment of the peritoneum and the absence of tension when an exudate develops in this region. A dull aching pain in the region of the wound arising about the fifth to seventh day indicates an infection of the wound. Removal of the superficial sutures and drainage relieves the patient immediately. Painful excoriation of the skin from the discharge of a fecal fistula occurs when the fistula drains the contents of the ileum. It is easier to prevent than relieve this pain and in all right side fecal fistula whether postoperative or preoperative petrolatum gauze around the opening should be used to prevent excoriation.

The administration of fluid is the most important postoperative consideration. The method used and the rapidity with which it is restored to the tissues varies. An infusion of saline or glucose solution is indicated in the presence of severe degree of shock, hemorrhage or toxemia. Large intravenous infusions before operation in those patients with a marked degree of anemia are apt to produce a pulmonary edema unless given slowly, over a period of two hours, and for this reason they are rarely considered necessary. The acute and severe intestinal toxemias occurring in obstruction cases are benefited by infusion into the vein of glucose and soda bicarbonate solutions and it is only in these cases infusion into the vein is often employed. Hypodermoclysis with three per cent. glucose solution given under the breast or in the flank is the method of choice. It may be employed over long periods of time, given slowly, is a safe procedure, requires little attention, and is painless. Absorption of fluid from the left side is not interfered with in Friedreich's resection and other operations upon the right side and transverse colon and considerable fluid will be absorbed from the introduction of retention enemas of glucose and soda bicarbonate solution. Four ounces of fluid injected into the rectum every four hours to be retained is a safe procedure if the rectal tube is passed before each injection to prevent a collection of unabsorbed fluid. Flushing the rectum and sigmoid with normal saline between injections increases the absorption of the glucose and soda solution. Fluid by mouth is begun early as a part of the diet. The administration of glucose and soda bicarbonate solutions intravenously should always be controlled by the chemical analysis of the blood and in the absence of an analysis normal saline should be used.

The general rules regarding preoperative feeding apply to the postoperative diet in so far as the general needs of the patient are concerned. The method of giving the essential food carbohydrate in solution, is the simplest way of taking a large amount of food under any circumstances and it is ideal in patients without the use of the colon as a digestive organ. There is no residue left to be carried into the colon and with no residue the absorption of water is almost complete in the small intestine which eliminates the colon from the digestive function and maintains an adequate alimentary intake of calories and fluid. After four to six hours, depending upon the amount of immediate vomiting from the anesthetic, fluids in the form of tea with sugar, plain tap water and with a small amount of lemon juice and a large amount of sugar, ginger ale and carbonated waters. No milk, fruit juices, broths nor ice water. On the second day may be added strained gruels with sugar, four per cent. milk, toast softened with milk and coffee. Soft diet on the third day according to the appetite of the patient, being careful to eliminate those foods with cellulose residue and large amounts of fat. By the fourth day a solid diet sufficient to meet the needs of an average individual should be worked out to contain little or no residue and small amounts of fat and protein. More calories are required on the first and second day after operation than on any of the succeeding days and this food should be administered by mouth in the form of carbohydrate or if that be impossible, because of vomiting, it should be given intravenously to prevent the body drawing upon its store of glycogen and when that becomes exhausted withdrawing the stored up fat which when incompletely oxidized becomes one of the most serious dangers of the operative period in these patients, an acute acidosis.

Soda bicarbonate should not be given as a routine but only in those cases showing an acidosis and then the administration should be carefully guarded with frequent examinations of the urine and blood for signs of suppression and alkalosis.

Vomiting after ten hours should receive treatment. Acute dilatation of the stomach is uncommon; the vomiting is most often prolonged anesthesia type in a neurotic individual; from acidosis or from the reflex irritation of a pelvic peritonitis. Autolavage with ten ounces soda bicarbonate solution, sixty grains soda, will cleanse the mucus from the stomach and stop most of the neurotic type; treatment directed toward the acidosis clears up that type quickly; the vomiting in cases with localized pelvic peritonitis requires frequent washing of the stomach with the tube.

Meteorism is a distressing complication when it occurs. The time to prevent it is preoperatively, cleansing the colon is the best means, and when that is completely carried out the convalescence is less disturbed by gas pains in these patients than it is in the average appendectomy. Rectal tubes relieve distention very often in cases having large abdominal incisions and should always be given a thorough trial with the aid of hot stupes and carminatives. Medicated enemata, ounces eight, can be given with all safety in patients with right sided anastomosis and is the best means of relieving distention. When the left side bears the anastomosis, while enemata can be given and at times are necessary, they do subject the colon to an undesirable strain. The injection of two ounces warm olive oil in the tube resections of rectosigmoid and sigmoid will cleanse the tube and permit of fecal passage. The majority of left side anastomoses have a cecostomy for drainage and irrigation of the colon through the cecostomy opening is the most successful means of relieving distress. Cathartics are not indicated during the first two weeks, such overloading the colon and strain upon the point of anastomosis occur from the use of cathartics as to endanger the line of anastomosis. Proper dieting obviates the use of cathartics.

With the colon eliminated as a means of excretion and often following continued absorption of putrefactive material from a partially obstructed colon, there is an unusual tendency for the development of acidosis. Preliminary administration of a carbohydrate diet, elimination of fats, forcing fluids and the administration of alkali as indicated by the changes in the blood chemistry will prevent the development of this most serious complication. In the acute cases it will occur and has to be treated by alkalinization both by mouth, at times intravenously, and forced feeding of carbohydrate.

Many of the wounds become infected, interrupted silk worm gut sutures placed about half an inch apart allow drainage through the interspaces, and most wounds heal in ten days to two weeks. Sutures should not be removed before the twelfth day. When drainage is considered necessary it is usually placed down to the point of anastomosis and this should not be removed before the fifth or seventh day.

Complicating infections take place in four definite groups and each is characterized by the time it occurs. High temperature and signs of peritonitis within thirty-six hours is from infection of the peritoneal cavity at the time of operation. Death from infection during the first three days which is preceded by high temperature stupor, suppression of urine, little or no distention, little vomiting and rapid pulse is the result of an ascending retroperitoneal infection usually with one of the gas forming organisms. High temperature and signs of a peritonitis in a patient who has been convalescing normally up to the fourth day is the result of infection through sloughing of the gut. High temperature and signs of peritonitis in a patient on the ninth day is from an infection through lack of healing of the joined ends. The only treatment for these infections that is of life saving dimension is in the preliminary preparation of the colon, cleansing and reducing the virulence of the organisms by drainage and irrigation.

A true uremia can practically always be avoided by the early and repeated examination of the blood and by being guided by those findings as to the time to operate and the type of operation for drainage. Draining the colon is somewhat similar to draining the bladder in prostate cases before attempting prostatectomy in that the tendency for the occurrence of uremia is lessened, in both, by drainage and irrigation.

Fecal fistula occurring on the fourth day from sloughing of ends is usually followed by infection and death. Fecal fistulæ frequently occur following tube resections of the sigmoid and rectosigmoid. In these cases the drainage should be left to the seventh day as healing very often is slow and the sutures may absorb by the ninth day without complete healing of the joined ends. Fecal fistula of this sort is seldom the cause of death and it heals without operative interference.

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Cancer of the Stomach

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INTRODUCTION.

Cancer of the stomach can occur at any period of life from infancy to old age, but it is most frequently met with between the ages of forty and seventy. In the census reports for 1900 the death rate for cancer of the stomach was about ten per cent. for 100,000 persons living in the registration area. Of these three per cent. were between the ages of fifteen and forty-five, and thirty-five per cent. between forty-five and sixty-five.

Again, the disease is more frequent in males than in females. Osler gives the ratio as 5.2:1; Brinton as 2:1; Mayo Robson 1.2:1; W. J. Mayo thirty-eight per cent. in the male to twenty-two per cent. in the female, or in the ratio of 1.8:1.

More than thirty per cent. of all cancers in civilized man are found in the stomach. To account for this great frequency of carcinoma in this viscus, many theories have been advanced, and they all lack scientific substantiation. The production of cancer has no bearing on the acidity of the stomach; for the secretion is not in the stomach, but is generated and secreted through its glands. It has nothing to do with the dietary of civilized man. Why the disease is not found in the stomach of the lower animals needs investigation.

Mayo (1) and others call attention to the action of heat as a cause of cancer, emphasizing the occurrence of the disease in locomotive engineers who are for years subjected to the prolonged heat of the firebox, with resulting cancer of the shins arising from chronic heat irritation.

Cancer of the skin of the face, so common among Australians, has its genesis in a peculiar climatic heat irritation. The well known cancer of the lip in men is asserted by some of the best students of the study to be due to the constant heat and irritation of the baked clay pipe, which the smoker is in the habit of breaking off short; the wet epithelium clinging to the absorbent clay and is peeled off the lip when the pipe is removed; this leaves the mucous membrane denuded and sore, with the result of a beginning local inflammation. This is the early formative stage of a beginning epithelioma.

These prefatory remarks have been introduced to sustain the theory now largely accepted that hot food and drink are causative factors in the production of gastric cancer, *per contra,* that the food of the lower animals is partaken of in a cold or at least not in a hot condition. Another interesting fact brought forward is the occurrence of cancer of the throat and esophagus in Chinese men, who constantly partake of extremely hot rice; their wives eating at a later table and partaking of cold rice; the women do not suffer the carcinomatous affections of the male sex.

Heredity seems of importance in etiology in a certain number of cases. The significance of local irritation is suggested by the great frequency of cancer at the narrowest portion of the stomach, mainly at the pylorus, and by the previous occurrence of ulcer (*Ulcus carcinomatosum*).

FROM ULCER TO CANCER.

The subject of a transformation of ulcer of the stomach into cancer was first discussed by Cruveilhier, in 1839; the following year Rokitansky took up the subject and in 1848, Duttrich elaborated so largely upon the subject as to arrest general professional attention. For the past seventy-five years this study has, almost yearly, attracted wide discussion; at the present day it is undeniably conceded that the transformation of gastric ulcers into gastric cancers is not inconsiderable. Fenwick, Plange, and Berthold estimate the number of carcinomata beginning in chronic ulcers at three per cent., Wollmans at six per cent., Rosenheim and Hauser at nine per cent. The Mayos in a series of 157 cases of gastric carcinoma found a history of sixty per cent. of ulcers. Zenker believes all or nearly all of these carcinomata depend upon a previous ulcer, and Mayo Robson (2) asserts that: ". . . In no less than 59.3 per cent. of cases of cancer of the stomach in which I have performed gastroenterostomy for the relief of symptoms, the disease having advanced too far for gastrectomy, the long history of painful dyspepsia suggested the possibility of ulcer preceding the onset of malignant disease."

An analysis of 1,796 cases collected by Furnival, showed the pylorus to be affected in 1,110 instances; the lesser curvature in 197, the cardiac orifice in 158; the rest of the stomach in 331 instances. In a study of the reports of 9,000 deaths from cancer of the stomach in the United States in 1900, Dowd (3) called attention to the fact that very few of these patients had submitted to any kind of surgical treatment.

The pylorus is the most common seat of gastric cancer, hence the surgeon is afforded a more ready means of diagnosis because of the palpability of the neoplastic growth. On one thing the profession seems divided. There are many who argue that the recognition of the tumor by palpation indicates the probable futility of operation; others declare that this opinion was long ago exploded and that most often excellent results are attained by operation in just such cases.

The operations for gastric cancer are: 1, Simple exploratory incision; 2, gastrectomy (partial or complete); 3, gastroenterostomy; 4, gastrostomy; and 5, jejunostomy. We shall confine ourselves in the present paper to some thoughts relative to exploratory incision and gastrectomy; two operative procedures that are of great importance in themselves, and which offer a series of thoughts well adapted to the brief space in a paper of limited proportions.

Although exploratory incision for the purpose of making a diagnosis is, as a rule, undesirable, in certain cases the operation is not only justifiable but strongly to be urged. Thus, when a gastric carcinoma is strongly suspected but is by no means a diagnostic certainty, exploratory incision is practised by many surgeons, a procedure which is approved by the great body of the best operators. An exploratory operation may also be required in certain cases of palpable tumor of the stomach in which it is possible that the growth may be amenable to surgical treatment, but it cannot be assured in advance whether the lymphatic glands are too extensively involved, or the disease has so far invaded the adjacent tissues, that removal of the growth would be useless, and when a gastroenterostomy or a jejunostomy may have to be performed as a palliative measure.

Great interest attaches to the subject of gastrectomy. As far back as 1810, Merren, operating upon a dog, showed the possibility of successfully removing a pylorus. Sixty-nine years later the same operation was attempted upon a man. The first successful operation, however, was performed by Billroth in 1881. For the successful outcome of a gastrectomy, it is necessary that the operation be undertaken at an early enough stage of the disease; before there is extensive lymphatic involvement, before extensive adhesions have formed, and before secondary growths have developed.

It is the opinion of many of the best surgeons that for cancer involving the pyloric end of the stomach and the lesser curvature which constitute by far the vast majority of cases of cancer of the stomach, removal of the diseased area well into the healthy tissue, closure of the end of the duodenum, and direct anastomosis between the cut end of the stomach and the side of the jejunum, as advised and practised by Billroth, is the operation of choice and the one attended with the best possible results. Until the year 1906, Kocher had performed 110 partial resections of the stomach with a mortality of twenty-four per cent. Between the years 1896 and 1910, inclusive, Mayo Robson performed one hundred gastrectomies with a mortality of fourteen per cent. Paterson, in a collected series of twenty-seven cases of total gastrectomy, reports ten deaths, a mortality of thirty-six per cent.

Total removal of the stomach is in no way incompatible with good health and long life. In cases of this kind, the upper end of the duodenum or the lower end of the esophagus, or both, become dilated, and serve the purpose of the stomach, although to a limited extent. The mechanical functions of the stomach can be vicariously performed by the mouth and by a careful selection of diet. The digestive functions of the gastric juices can be taken up by the pancreatic and intestinal secretions; and the absorption which normally occurs in the stomach can readily take place in the small intestine.

An interesting review of what results may be expected from radical operations for cancer of the stomach are thus reported by W. J. Mayo (1). Up until 1918 he mentions nine subtotal operations, i. e., operations where the entire stomach was removed, allowing only enough of the gastric tissue to afford an anastomosis. In one instance, the entire stomach and a margin of the esophagus were removed, and he reports that the patient made an excellent recovery. From October 10, 1897, to October 10, 1917, there were 651 resections of the stomach for cancer. Of 427 patients operated on from 1915 to 1918, inclusive, 311 were traced. Of this number 120 or about 38.5 per cent. were alive three years or more after operation. In a series of cases that aggravated 313 patients, 239 who recovered from the operation were traced, and 62 of these, that is twenty-six per cent., were alive five years or more after the operation. The same surgeon reports that thirty-five lived for six years or longer after operation; twenty-seven lived seven years or longer; eighteen lived eight years or more; ten lived nine years or more; five lived eleven years; three lived twelve years or more, and one lived for fifteen years after the operation.

Just above we referred to the twenty-seven cases collected by Paterson, with ten deaths. Of the remainder of these cases (all gastrectomies), six of the patients lived, respectively, eight years, seven years, five years, four years and nine months, three years and six months, two years, and one year and nine months.

"After a careful analysis of all cases operated in," remarks Mayo Robson, "I cannot help feeling that far too gloomy a view is taken of cancer of the stomach; for if the disease is caught early and a wide excision performed, care being taken to remove the lymphatic area of the stomach with the glands along the lesser curvature, results of a most favorable nature will reward our endeavors. Our great hope of success, I venture to stake at the risk of being accused of reiteration, lies in early and complete removal."

It has been my unfortunate experience to diagnose promptly not a few cases of socalled dyspepsia as gastric carcinoma. It should never be forgotten by the medical practitioner that dyspeptic symptoms, unrelieved after a sufficient period of time by intelligent medication, may be the insidious development of a malignant growth.

In conclusion, mention need be made of the absolute necessity of röntgen ray examinations as an aid to diagnosis. It has been shown that in ninety-five per cent. of cases of gastric carcinoma, the rays will show its presence before the occurrence of appreciable symptoms. All cases of persisting anemias should be a signal for the employment of this adjunct to diagnosis, for it has been abundantly proved that gastric cancer, as well as cancer of the cecum and the ascending colon, over a long period of time, may only evidence this insidious symptom, while the malignant neoplasm is steathily creeping upon its unsuspecting victim.

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218 SOUTH FIFTEENTH STREET.

The Nonrecurrence of Gastric Cancer After Operation*

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In one out of every three men and in one out of every five women who contract cancer, the stomach is the organ attacked (1). All other methods of treating gastric neoplasms having proved futile, our only hope of prolonging life and affecting cure is in surgery. However, despite the numerous radical cures that have been reported in the literature, great skepticism exists among the profession as well as among the laity as to the usefulness of operative procedures in this condition. Most of the publications inspire little confidence because they deal only with large statistical groups and vague generalizations, without presenting individual cases for critical study.

Moreover, important details are usually missing. How many patients after a period of years are not only alive but also cancer free? Do not many or all of them finally succumb to malignancy? In the favorable cases, how was the original diagnosis of gastric cancer established—clinically, chemically, radiologically, or surgically? Was it subsequently sustained histologically? Nor is a bare statement that microscopic examination showed cancerous tissues altogether convincing when the name of the pathologist who made it is either not given at all or his competency is doubtful. As Stockton (2) says: "Occasionally there is a case in which the result of early excision has been so flattering that the skeptical look suspicious at the microscopic section by means of which the disease was verified."

Nevertheless, there are a number of publications from eminent sources which prove beyond all doubt that gastric cancer is curable by early operation. Thus William J. Mayo (3), in a series of 651 resections of the stomach from 1897 to 1917, in which the malignancy of the tumor was in each case histologically demonstrated, reports the following encouraging figures: Out of 311 patients traced, 120 were alive more than three years after operation; out of 239 traced, sixty-two were alive more than five years after operation, thirty-five lived more than six years, twenty-seven more than seven years, eighteen more than eight years, ten more than nine years, seven more than ten years, five more than eleven years, three more than twelve years, and one more than fifteen years.

Weil (4) reports the following end results from radical treatment of gastric cancer histologically confirmed at the Breslau Surgical Clinic between 1891 and 1911: One patient well after twenty-one years, one well after nineteen years, three after fourteen years, two after thirteen years, one after eleven years, and thirteen well from four to nine years after operation. John Douglas (5) reports three patients well more than five years after pylorectomy. Peck (6) finds that radical excision was performed in thirty-three out of 527 cases admitted to several New York hospitals in the last six years; only twenty-three patients recovered from operation, and of these eight were known to be well for four years or less. Woolsey (7) has two cases out of eighteen in which the patients were well more than four years, Willy Meyer (8) one patient well more than ten years, and Hartmann (9) has three patients well after five years, three after six years, two after seven years, and one after thirteen years. Moeller (10) reports survival for more than five years of ten per cent. of the 147 patients operated upon at Lund since 1898. Friedenwald (11), on the other hand, did not see a single recovery in 266 of his own radically treated cases. Deaver (12) says that the combined statistics of the large clinics indicate that twenty to thirty per cent. of all patients will live more than three years after gastrectomy, and that from ten to twenty per cent. will be alive at the end of the five year period.

The variations in these figures doubtless result, for the most part, from the relative earliness of the operation. All writers insist upon early operation, but there are few attempts to define the factors upon which the earliest possible diagnosis can be formed. William J. Mayo (3) says that a probable diagnosis in early cancer can be established by simple methods. He seems to me, however, to be too modest in his demands upon the diagnostician. Although the mechanical and chemical signs which he enumerates may be present in some cases of very early involvement of the pylorus, they are usually only manifest when the cancer has already become well established. To advise operation in a sweeping generalization, as he appears to do, only upon the finding of a palpable tumor, obstruction, food remnants, deformities or muscular deficiencies revealed by the x ray, Boas-Oppler bacilli, and other typical signs of cancer, certainly invites tardiness. To wait until we know positively that we have carcinoma may occasionally prevent an unnecessary operation but, on the other hand, it works havoc on the side of sacrificing possible salvage. The surgeon will then generally find a hopeless state of affairs because of extensive metastases, adhesions to inoperable organs, the patient's inability to stand the shock, and other unfavorable factors. In any event the prognosis is, of course, dependent upon the variety, situation and extent of the cancer, but as the only alternative is a mortality of one hundred per cent., the patient, in the very early cases, has everything to gain and nothing to lose by prompt operation. Success is obviously directly proportionate to the earliness of the operation. Reasonable grounds for the suspicion of malignancy in these cases imperatively call for surgery, and these grounds are, in the first place, to be sought in a careful study of the history.

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From the purely clinical point of view, we encounter, broadly speaking, two types of primary gastric cancer, one which suddenly appears in a previously entirely healthy stomach, like a bolt from the blue sky, and one which develops in association with a preexisting ulcer. In the cancer without previous lesion, the growth of the tumor is much faster and the local as well as the systemic changes correspondingly more rapid. Radical therapy is, of course, more promising in the postulcerous form of cancer, because there is less carcinomatous tissue to eradicate and less diffuse infiltration of the stomach wall, and also because, on account of the intimate association of the ulcer, the operation amounts practically only to a wide removal of the ulcerous area and of any easily excised enlarged glands.

Since the responsibility rests upon the physician, our attitude must be one of watchful readiness. No condition in medicine makes a greater tax upon diagnostic intuition and is less susceptible to hard and fast rules. When a patient in the cancer age presents himself with a gastric complaint, every clue that either tends to exclude malignancy or to point toward it must be painstakingly collected and analyzed. Briefly reviewed, the available data are:

THE CLINICAL HISTORY.

In postulcer cases a perceptible change from periodicity to constancy of symptoms, particularly of a progressively downward nature, in a person within the cancer age, should arouse attention. Though the patient may not know that he had an ulcer, he will, on careful questioning, give a history of chronic and periodical ulcer characterized by repetition of the gastric symptoms, especially periodical burning, sour belching and digestive distress, with intervals of keen appetite and marked improvement or even of entire well being between the attacks. He may even be able to recall one or more occasions upon which, for no apparent reason, he had an attack of weakness with tachycardia or even syncope—phenomena suggestive of a hemorrhage from a gastric ulcer. Now he is conscious of stomach symptoms during the entire twenty-four hours and they are not so closely associated with the ingestion of food as in ulcer; in other words, the ulcer symptoms still predominate, but a counterpoint of cancer is barely becoming noticeable. There is increasing aversion to food, particularly to meat. His physical appearance usually indicates decline in health, and there has of late been progressive loss of weight and vigor.

In the type without previous ulcer history, i. e., presenting the appearance of a sudden or acute insidious gastric complaint in a subject who has always been well, the onset of the trouble is usually ascribed by him to some dietary indiscretion or to a more or less improbable cause. Here there is the same gradually increasing anorexia, and especially aversion to meat, the same dyspeptic symptoms of pressure, gas, belching, even pain not necessarily connected with the ingestion of food, persistent nausea and the same story of recent physical failing. Occasionally vomiting occurs, even in the earliest stages, sometimes associated with visible blood streaks. The appearance of this blood is what usually causes the patient first seriously to seek medical advice. A sudden gastric complaint in the cancer years with no real cause to account for its onset, which does not readily yield to the customary treatment, with the patient becoming worse rather than better, and in which palpation reveals local tenderness or the signs of infiltration or induration of the stomach or possibly a movable tumor, constitutes perhaps the earliest possible clinical picture of a primary carcinoma. This applies more particularly to growths in the body of the stomach; in those at or near the orifices we have, in addition, spasms as well as signs of obstruction, or, occasionally, even of a patulous orifice with overrapid emptying. The possibility of a sarcoma, a benign tumor or of syphilis should also be borne in mind.

LABORATORY FINDINGS.

Since a simple chronic ulcer calls for a high hydrochloric acid figure, gradual diminution of this acid in a middle aged individual is an important sign, especially when accompanied by mucus and blood and a positive Wolff-Junghann's reaction. At the Mayo Clinic it was noted that the cancerous stomach always contained some acid, although free hydrochloric acid was often absent. There may be occult blood in the stool very early in the disease. In the primary form of cancer the laboratory indications of malignancy are to be found very early, while in neoplasms following ulcer, the laboratory findings very often are only those of ulcer.

RADIOLOGICAL DIAGNOSIS.

Röntgenologists acknowledged that the x ray is not infallible in the diagnosis of early gastric cancer, but together with the history and laboratory findings it usually completes the evidence in the type without previous history. When the tumor is situated at the pylorus, in the antral portions of the stomach, or along the curvatures, the radiological indications of carcinomatous changes can be seen very early.

Where the tumor follows upon an ulcer the differential diagnosis in the early stages is often very difficult. The x ray is of especial service where the growth is on either of the curvatures or at the orifices of the stomach; here it will show infiltrations of the walls that cause them to become stiffened and lead to breaks in the peristalsis. These breaks, however, must be constant, on all the plates or else they are of no significance. George of Boston has called attention to the annular character of the filling defect in very early pyloric carcinoma.

Tumors in the body of the stomach, particularly in the posterior wall, may attain a large size, without becoming distinctly evident under the x ray, but a constant thinning of the bismuth shadow is an early indication of centrally located gastric carcinoma. Positive x ray findings place the case into the surgical category for at least exploratory incision. When negative x ray findings in very early cases contradict strong clinical and laboratory evidence, the patient should be kept under supervision and treatment and the radiographic examination repeated at frequent intervals until the case is cleared up.

The cases herewith presented illustrate and emphasize my viewpoint. In these, the diagnosis, though necessarily formed on suspicion and not on proof, was vindicated by the histological reports of pathologists of recognized standing, and these reports are appended so as to leave no possible ground for challenging the results.

CASE I.—C. L., aged sixty-seven, seen November 27, 1917, stated that he had always been well until two weeks ago, when, without apparent cause, he suddenly vomited sour fluid three times in one day. Two weeks later he again vomited with a slight amount of blood. For two weeks there has been almost constant epigastric heaviness, aggravated by food ingestion, and also increasing sitophobia. There has been no pain, but constant nausea, weakness, slight dizziness, pallor and loss in weight. Careful questioning elicited a long history of very rapid and excessive eating, of frequent sour belching and the avoidance of fried and sour foods and pastries. Two years ago, following a heavy dinner, there was a sudden short attack of unconsciousness with immediate recovery. Since then, on and off, there had been slight attacks of dizziness.

Physical examination showed a large framed man, moderately anemic and looking somewhat worn. The abdomen was soft, flabby and moderately pendulous; the liver border easily palpable, but of normal consistence; the abdomen was otherwise negative, excepting slight point tenderness in the duodenal pyloric regions. The stools were negative to occult blood. In the fasting state no stomach contents could be obtained; a test breakfast yielded one ounce with free hydrochloric acid 22, total acidity 34, no lactic acid; no occult blood; microscopically negative. Röntgenological examination showed the stomach to be normal in position, size and shape, but revealed a constant irregular filling defect at the pylorus. There was rapid emptying of the opaque meal. The duodenal cap was filled and normal. The radiological diagnosis was "chronic ulcer at the pylorus with probable carcinomatous changes."

Operation was performed by Dr. A. A. Berg on December 19th at the Mt. Sinai Hospital. A very large callous ulcer, too indurated to be regarded as benign, was found on the lesser curvature very near the pylorus. A total resection of the tumor mass with posterior Murphy button gastroenterostomy was done.

The following is the report of the examining pathologist, Dr. F. S. Mandelbaum: "The ulcer of the stomach removed by Dr. Berg from Mr. C. L. is the seat of an extensive infiltration carcinoma. Nests of carcinoma cells are present between the layers of muscle fibres down to the peritoneum. The mesenteric lymph nodes show an active metastatic process. In the nodes the carcinoma is distinctly adenomatous in type, while in the ulcer proper the type cannot be established absolutely."

The patient made a good recovery and has remained in excellent condition to date, five years after operation.

CASE II.—Mrs. E. C. S., aged fifty-one, married, one child, referred by Dr. Van der Smissen, March 2, 1912. For many years, immediately or a few hours after meals, had had epigastric pressure, relieved by belching of tasteless gas or sour fluid; also often was nauseated after meals. Two of three protracted periods of marked epigastric burning had been relieved by medicine. Weight had fluctuated for one year. For about six weeks there had been continual nausea, but no vomiting, persistent epigastric pain only slightly relieved by food, and a constant sensation of fulness from the epigastrium to the throat, relieved by soda bicarbonate. Despite a ravenous appetite the patient was losing weight. Two weeks previously and the night before coming to the hospital she had brought up a rather large amount of bright red blood.

Physical examination showed a slender, pale, highly emotional woman, with a small cystic goitre, and a mitral regurgitant murmur. The abdomen was soft, relaxed, and contained a fairsized, easily palpable, single uterine fibroid. One finger's breadth above and slightly to the right of the umbilicus was a circumscribed, hard, nodular mass about two inches long, freely movable and slightly tender. A fasting stomach test yielded only half an ounce of brownish yellow alkaline fluid, showing a few meat particles; one hour after test meal, five ounces of brownish yellow stomach contents with few blood streaks; solids three ounces; mushy and poorly digested. Free hydrochloric and lactic acids were absent. Total acidity, 24; few gross and microscopic meat fragments. Stools negative for occult blood.

Diagnosis.—Chronic ulcer with probable cancer. Operation was advised and performed a few days later, at the German Hospital, by Dr. George Semken. A freely movable and circumscribed tumor was found near the pylorus; a few enlarged glands on the lesser curvature; tumor, including pylorus, resected; stomach and duodenal wounds closed, posterior gastroenterostomy. The tumor was two inches long, showed few external changes, but was mostly made up of a shallow, round, indurated ulcer, only one part of which showed cancer.

The following is the report of the pathologist of the German Hospital, Dr. Francis Carter Wood:

"*Gross appearance*:—Specimen consists of, a, small piece of tissue removed from the edge of a tumor of pylorus for diagnosis; it is firm and one section shows few small yellowish necrotic areas; b, strip of gastric wall mucosa and muscularis removed from normal part of organ; c, lymph nodes from pyloric region.

Microscopic examination shows, a, adenocarcinoma which infiltrates all layers of the wall. Composed of irregular gland structure and lined for the most part by a single layer, but in some places by multiple layers of columnar epithelium, which rests upon a distinct basement membrane. Stroma scanty and shows considerable infiltration (round celled). Mitotic figures not abundant; b, entirely normal gastric membrane; c, lymph node, the germinal centres of which are prominent. Peripheral sinuses show desquamated endothelial cells. No metastases found. Diagnosis: Adenocarcinoma of the stomach."

Patient is still alive ten years after operation and perfectly free from stomach symptoms.

Case III.—Mrs. F. J., aged fifty-four, was seen in consultation with Dr. A. D. Mayer, October 25, 1917. She had always been of a very emotional temperament; menopause occurred nine years before. For very many years she had had mild symptoms of hyperacidity without definite pain, only heartburn. For three years these had become more pronounced, particularly sour belching of gas or fluid with mucus. Diagnosed and treated then as a gastric neurosis by a gastroenterologist. Periodical improvement took place and general well being until last spring, when, following a severe mental strain, the gastric symptoms returned, associated with sudden, weak spells with great depression and weeping. In particular, she had a continuous pain under the left breast which seemed to be connected with her stomach symptoms. Stomach analysis then showed total acidity of 15. A second examination a few weeks later showed 45, with some blood mixed with contents. The string test was negative. Gastric symptoms improved very much during the summer spent out of town, although patient found he had to keep on an antiacid diet. Weight was practically always stationary. After her return to town in the fall, the gastric symptoms became more pronounced so that the patient had been in bed most of the time. Dr. Mayer, who believed that the case was one of chronic ulcer, felt suspicious of a beginning malignancy and requested me to see the patient with him. She was well nourished but anemic and very weak. The abdomen was relaxed and negative to examination, excepting that there was an area of distinct tenderness, even to the slightest pressure in the left epigastrium, a little below the left costal arch. The feces were negative to occult blood. Only a fasting test was made and this showed no food retention. Our x ray examination proved extremely interesting. It showed a rather large active stomach, with a good sized constant pouchlike projection on the lesser curvature, which, in the oblique position, was demonstrated to be directly connected with the stomach. There was no six hour residue. Our röntgenological diagnosis was that of a penetrating ulcer or an anomaly in development.

In view of the above data the diagnosis of chronic indurated, penetrating ulcer of the lesser curvature with probably adhesions and possibly carcinomatous changes was made. I advised against medical therapy, and urged operation. The malignant factor was suggested by the clinical features of the case. The patient was operated upon on November 7th by Dr. Willy Meyer at the German Hospital. A large indurated ulcer of the lesser curvature, penetrating into the left lobe of the liver and surrounded by a dense adherent inflammatory tumor was found. Despite the extent of the tumor mass, a gastric resection extending beyond the pylorus, with gastroenterostomy, was successfully carried out. One portion toward the pyloric end appeared suspicious of carcinoma upon gross examination. Microscopical examination of this part showed adenocarcinoma.

Report by Dr. George L. Rohdenburg, pathologist of the Lenox Hill Hospital: "Mrs. F. J., November, 1917. Diagnosis, carcinoma of the stomach arising in peptic ulcer.

Gross appearance.—Specimen consisted of a portion of stomach ten by five cm. in diameter. Upon opening the organ there was found a craterlike ulcer with indurated margins four by two by one cm. in diameter. Its base was firm and yellow and in one portion there was a perforationlike slit, two by 2.5 cm. Section through wall of the ulcer was extremely resistant. At the border near the perforation was a yellowish mass, 0.5 cm. in diameter, directly beneath the base of ulcer and extending completely around the area of perforation.

Microscopic examination.—Stomach mucosa ulcerated over extensive area showed here and there remains of gastric tubules giving evidence of attempts at regeneration. In the yellow area situated beneath the mucosa there was an extensive development of carcinoma. The neoplastic cells were small, cuboidal and densely packed and supported by a hyaline, rather sparse stroma. In this area were many mitotic figures. Bloodvessel or lymphatic channel emboli were demonstrable. The new growth had penetrated the organ wall to the serosa although it did not appear to have perforated this coat. Round cells and polymorphous infiltrations were extensive. Diagnosis: Carcinoma of the stomach arising in peptic ulcer.

Five years after operation, the patient was in good health and reported to be free from stomach symptoms.

CONCLUSIONS.

1. The general pessimism as to the end results in timely recognized and immediately operated upon gastric carcinoma is not justified.

2. This applies particularly to cases in which the diagnosis has been predicated upon a thorough study of the clinical history and the faintest early indications, rather than upon the later appearance of the classical proofs of malignancy.

3. The signs described in the literature as characteristic of early carcinoma are so definite that a diagnosis made only after their appearance is already tardy. More should be expected of the physician's diagnostic sense, so that the patient is operated early enough to have the best possible chance for cure.

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A Contribution to the Study of Connective Tissue Changes in the Gallbladder

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Tumors of connective tissue origin are exceedingly rare in the gallbladder and since there is no little uncertainty regarding an interpretation, we feel that all such cases should be thoroughly studied and reported.

Landstiner (1) reported two cases of myosarcoma in which the predominant cells were of the spindle variety, arranged in bands, or modifications of these cells resembling smooth muscle. Bayer (2) published an account of two cases of primary sarcoma of the gallbladder. In one spindle cells predominated but in addition there were numerous round cells and multinucleated giant cells. The cells of the other were of the spindle and round cell types.

Iwasaki (3) in 1914 was able to find only eight authentic cases in the literature and reported one of his own. This tumor presented many features of productive inflammation with cells of polymorphous character (large and small round cells, spindle cells and many giant cells). Goldstein (4) in 1921 found sixteen reported cases of primary sarcoma of the gallbladder.

REPORT OF CASE.

CASE 1.—I. H., white female, aged forty-eight years, born in U. S., married, admitted to St. Elizabeth's Hospital in 1907 with a diagnosis of epilepsy.

Family history.—She was one of eight children, but because the entire family became separated, interest in the patient was apparently lost and a very meagre history accompanied her. However, it was determined that both father and mother were dead. Cause of and age at death were unknown. One sister died in infancy, another died of pneumonia at the age of twenty-eight and a third sister died in 1920 of carcinoma of the uterus. One sister twenty-five years old and apparently healthy, knowing nothing of the patient, believing her dead, was found just prior to the operation and gave these data.

Personal history.—The patient experienced the usual diseases of childhood, had a common school education, and denied the use of alcohol and drugs. She was married at the age of eighteen and had two children, one of whom died at the age of five months, cause undetermined, and the other was stillborn.

At the age of twenty-one she began to have epileptic convulsions, which became more and more severe until she was committed to an institution. There were no suicidal or homicidal tendencies.

On admission to the hospital at the age of thirty-three the patient was quiet, orderly, and cared for herself. She was correctly oriented as to person and place, but disoriented to time. Ideation was fairly slow but coherent and there was considerable mental reduction. Her emotional attitude was one of indifference to her surroundings. There were no delusions or hallucinations but her reasoning and judgment were defective and she had no appreciation of her condition.

Physical findings were not particularly significant except that the teeth of the upper jaw were in poor condition, bowels constipated, and deep reflexes were hyperactive. The weight was 135 pounds.

One month after admission she had several severe epileptic seizures following which she became disturbed, nervous, boisterous, and ran about the ward slapping and kicking the other patients, and attempted to throw herself from a window; however, as a rule she was quiet and orderly during the intervals between the epileptic attacks and remained poorly oriented. She did not mix well with other patients but was neat and tidy in habits and appearance; and ate and slept well. Her convulsions averaging about one a week were often severe and were usually followed by irritability, fault finding and clouding of the sensorium. These convulsions gradually increased until there were as many as two daily and a progressive mental deterioration with angry resistive attitudes developed.

Present illness.—Mrs. H—— was admitted to the Department of Medicine and Surgery of the hospital on April 4, 1922, with a note stating that she was suddenly seized on the morning of this day with a severe pain in the right side of the abdomen, accompanied by nausea and abdominal distention. When seen in the hospital ward she was lying on her right side, right leg flexed on abdomen and shoulders drawn forward. Respiratory excursions were short and occasionally grunty.

Physical examination.—Height about five feet, five inches, weight about 135 pounds, expression anxious, right lateral decubitis, knees drawn up, wellnourished, skin soft, dry and hot, face flushed, keloid on right shoulder, abundant brown hair, superficial glands not enlarged, ears well formed and symmetrical, no stigmata, mammary and thyroid negative, teeth absent, tongue coated. The abdomen appeared distended and not involved in respiratory movements except to a slight degree near the costal margin, but was fairly rigid and sensitive, this being most marked over the area of McBurney and in the region of the umbilicus. The abdomen could be palpated without complaint from the patient, with the exception of the above mentioned area where pain was severe and the slightest pressure was unbearable. When asked to place her finger on most painful area she pointed directly to the lower right quadrant. On percussion the abdomen was slightly tympanitic. Because of rigidity and pain, deep palpation was impossible.

Examination of the circulatory system revealed no organic lesion. On admission temperature was 101.4° F., with a slight afternoon remission to 100.8° F. and a rise the following day to 101.4° F., followed by a steady decline until on the sixth day after admission the temperature had reached normal. Pulse on admission was 100 and respirations 30, both receding in proportion to decline of temperature. Leucocyte count taken on day of admission reported leukocytes 30,000, polymorphonuclear cells 79 per cent., large lymphocytes 10 per cent., small lymphocytes 8 per cent. and transitional cells 1 per cent. On the third day after admission, April 7, 1922, another count was made and reported leucocytes 10,000, polymorphonuclear cells 79 per cent., small lymphocytes 18 per cent., large lymphocytes 2 per cent., transitionals 1 per cent. Blood pressure 140 systolic, 95 diastolic.

The respiratory excursions were short, 30 a minute, somewhat grunting and almost purely costal; otherwise negative.

There were no organic lesions of the genitourinary system. Uranalysis of specimen obtained on admission to ward was negative, as well as another specimen examined just prior to operation. A diagnosis of subacute appendicitis was made.

Operation.—The abdomen was entered and explored through a right rectus incision. The appendix was postcecal, rather long and fibrous in appearance, and firmly bound down by adhesions. The vessels were injected and stood out prominently. On examination the mobility of the stomach and duodenum was greatly reduced by bands running toward the liver, but otherwise normal. The kidneys, spleen and pelvic organs were negative, but in the region of the gallbladder a long firm mass was felt, decidedly of the consistency of liver tissue attached to the under surface of the right lobe of the liver at about the point where one would expect to find the gallbladder. Further search failed to reveal a recognizable gallbladder.

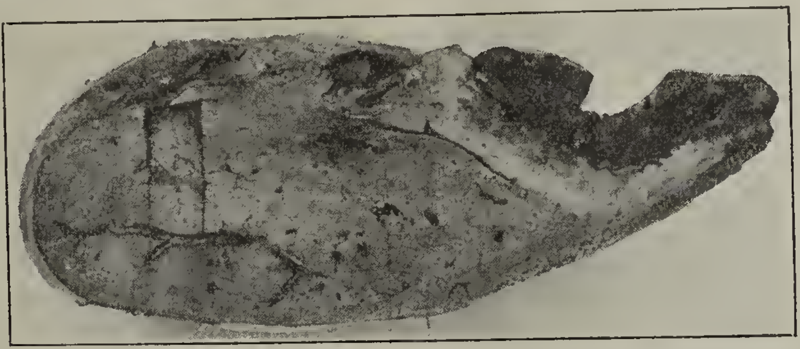

Fig. 1.—Section of liver through gallbladder area showing fairly sharp line of demarcation between the tumor and liver and infiltration about the duct.

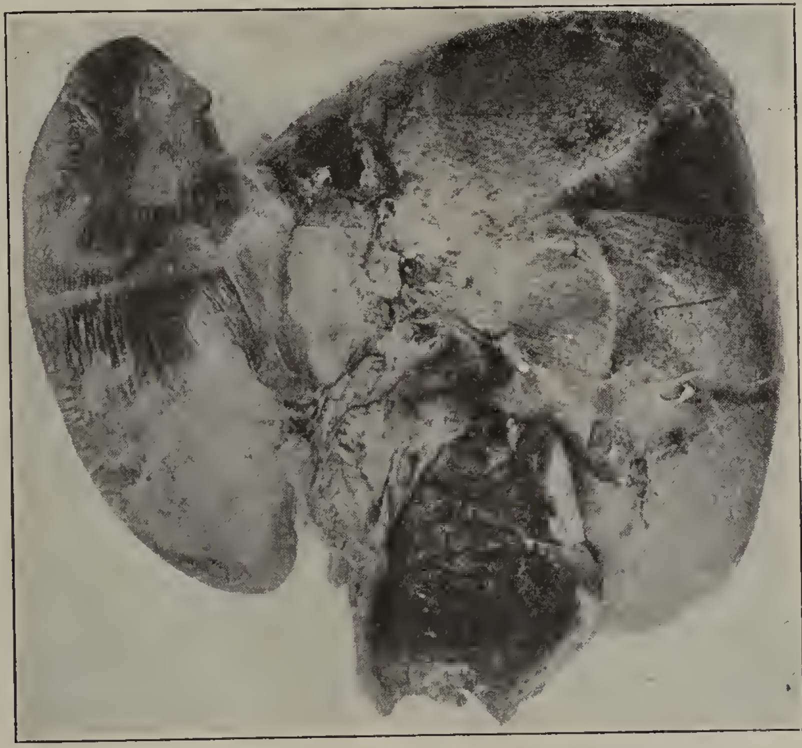

Fig. 2.—Showing thickened gallbladder with hemorrhagic lining.

The appendix was removed by the usual method. Visual examination of the mass under the liver revealed what appeared to be either a small accessory lobe of the liver, or a roughly triangular process of the right lobe slightly beneath the anterior margin. In color it was identical with the rest of the liver and as the anterior margin on either side approached the mass, it curved out toward the rounded apex of this triangular projection, there being complete fusion between it and the liver superiorly without even a fibrous line of demarcation, as might be expected were this a gallbladder.

Palpation revealed this mass to be firm, resembling liver tissue in consistence as well as in appearance; directed backward and downward, and about two inches posterior to the anterior margin of the liver it began to be constricted toward its superior surface, but at no point to the extent of a gallbladder. Traced back to its termination in what was shown to be the cystic duct it measured about six inches and through its thickest part it was estimated to be about two inches in diameter. At the middle of its length a large hard mass could be felt through the thick wall. The cystic duct felt much enlarged and firm and the common duct for about one inch below the junction was also thickened and firm, tapering off in its course to normal consistency. Lymph glands were palpable in the region of cystic and common duct. Bands of adhesions stretched from the stomach and duodenum to the gallbladder and surrounding structures.

The appearance, thickness of wall, consistence and extent of involvement suggested sarcoma. Adhesions were severed where necessary and the operation was cholecystotomy. A single stone about the size and shape of a bantam egg was removed from the cavity. The gallbladder walls were about one fourth of an inch in thickness, the red color of the exterior persisting in the depth. About a dram of very dark, thin bile, containing small black flakes, was obtained. Bile began to flow freely through the tube before the abdominal incision was sutured. Beside the tube in the gallbladder, a large cigarette drain was left in place to guard against leakage, because inversion with purse string was impossible owing to thickness and firmness of the walls.

The patient was returned to the ward and appeared to be in good condition, reacting normally from the anesthetic. A slight rise in temperature to 99.6° F. followed on the day after operation. On the second day the temperature rose to 101.4° F. and on the third day postoperative, April 12 at 3 a. m. she had a severe epileptic convulsion, following which the pulse was 148 a minute, respiration 26 and the patient died at 7 a. m. April 12, 1922.

POSTMORTEM FINDINGS.

The skull was very thick showing osteosclerosis, and the cerebrospinal fluid was in excess. The brain weighed 1190 grams and exhibited a generalized atrophy and gliosis of the cerebral convolutions with some surface congestion. Sections disclosed no gross lesions excepting a narrowing of the cortex and the ventricles were normal in appearance.

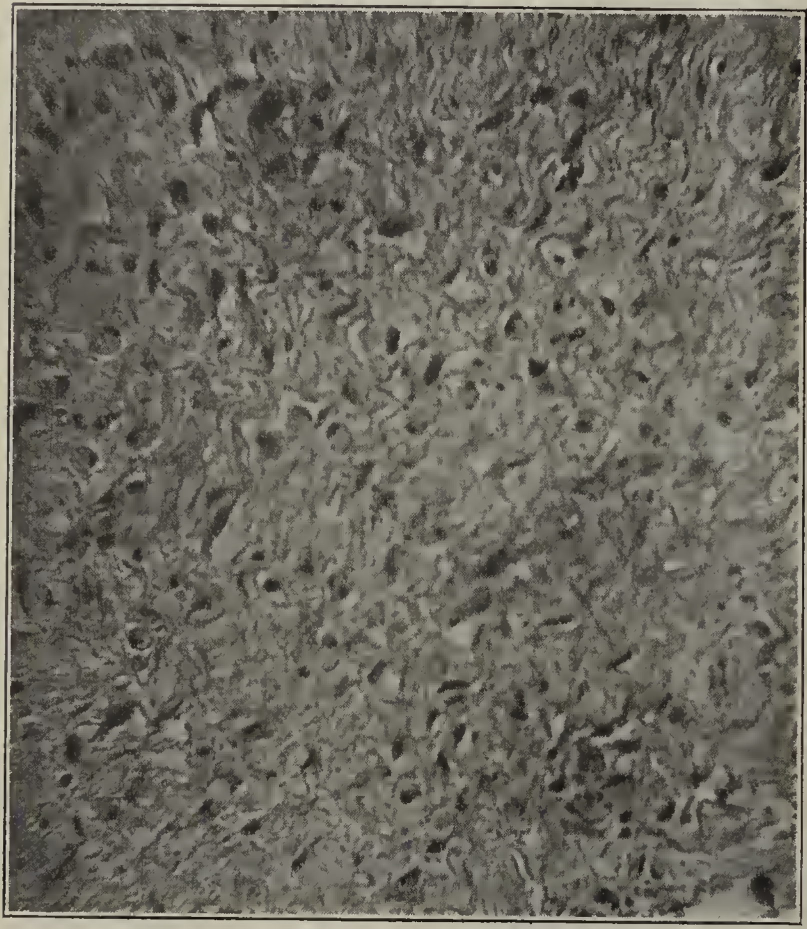

Fig. 4.—Photomicrograph (high power) of structure of gallbladder wall, showing large mucous connective tissue cells filled with mucin.

There was no evidence of tuberculosis or other chronic disease in the respiratory tract, but the lower lobes of the lungs showed a posterior early bronchopneumonic condition.

The heart was small (260 grams), was loaded with epicardial fat and the muscles showed considerable fibrous replacement with sclerosis of the columns and fibrosis of the area of the bundle of His. There was a moderate aortic stenosis. The aorta and its branches were very small and presented thin elastic walls.

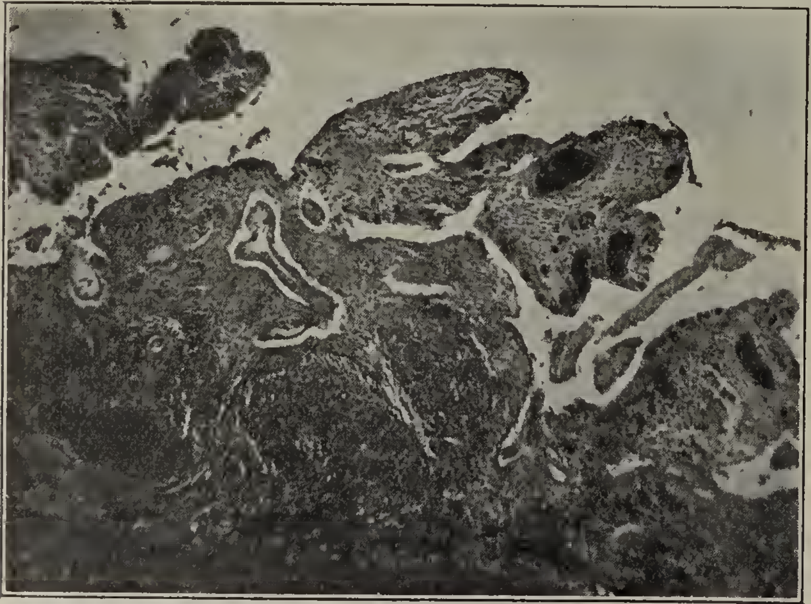

Fig. 5.—Photomicrograph (low power) of degenerated gallbladder mucosa, showing irregular formations of the villi.

The stomach and intestines were normal with the exception of the cecal area where the appendix had been recently removed. There was some irritation exudate but no infection. The pancreas exhibited an increase in the fibrous stroma and the spleen some secondary acute hyperemia. Both kidneys were small (100 grams each) and the capsules removed easily, but disclosed a reddened, irregular and granular surface. Sections showed general interstitial productions. The ureters and bladder were not remarkable. Considering the age the uterus, ovaries and external genitalia were normal.

The pituitary gland and its fossa were not remarkable but the thyroid was rather large in size, pale in color and impaired by overproductions of connective tissue. The colloid in general was diminished, but there were some large cystlike accumulations in the central areas of both lobes. The adrenals were unusually large, particularly the cortex, which was hypertrophied, in patches it was adenomatous in appearance.

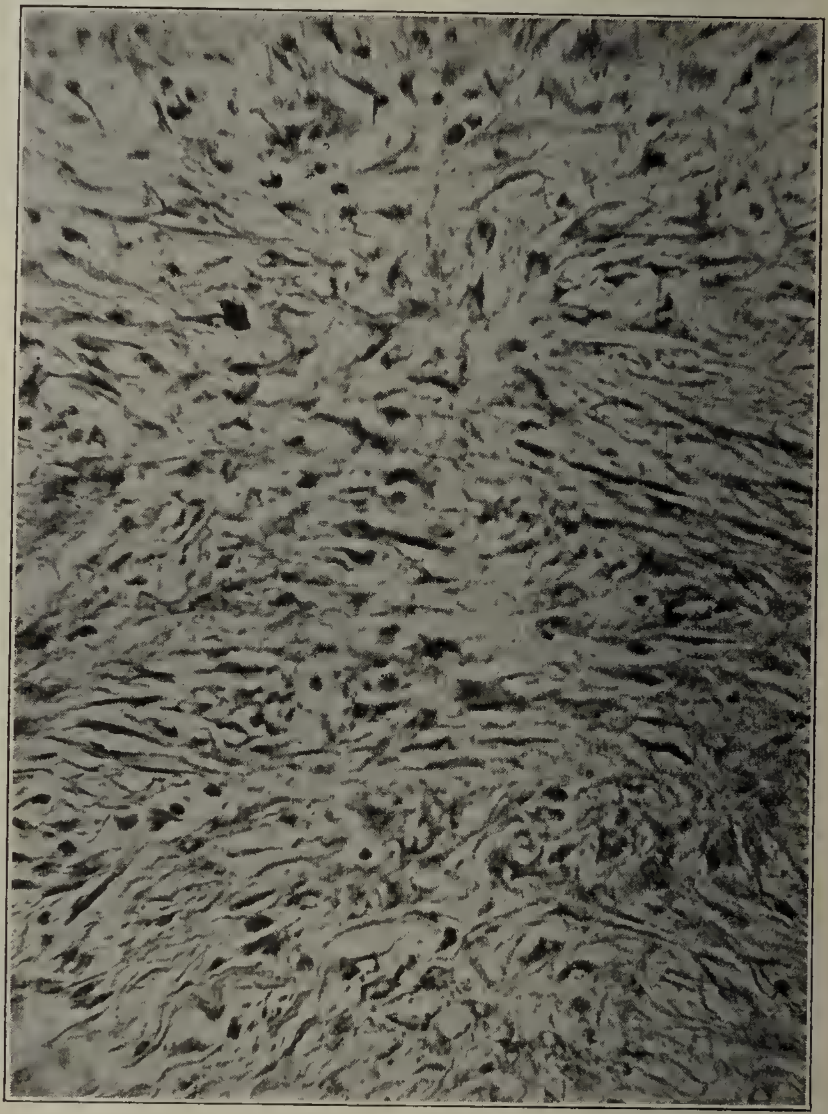

Fig. 3.—Photomicrograph of gallbladder wall (high power) showing spindle cell and branching cell construction.

The liver was tightly adherent to the omentum and to the transverse colon by recently formed fibrinous adhesions. The gallbladder had been opened and the tip excised for diagnostic purposes. The surface of the gallbladder strongly resembled the liver substance in color and was covered with a finely granular fibrinous membrane. The walls averaged a centimetre in thickness, but in places were nearly two centimetres thick. The tissue was fairly firm, translucent, greyish in color and shiny, and mucinous material was easily detected. Sections disclosed a fibrous tissue stroma filled with areas of fat and myxomatous appearing structure (Fig. 1). There were irregular lobulations of this tissue about the neck of the gallbladder and about the bileduct area (Fig. 2). The lining of the organ was thickened, granular, hemorrhagic and exhibited minute ulcerations, the surfaces of which were bathed in a slimy hemorrhagic exudate (Fig. 2.). There was one large central sunken area of ulceration which was probably the bed of the large excised gallstone.

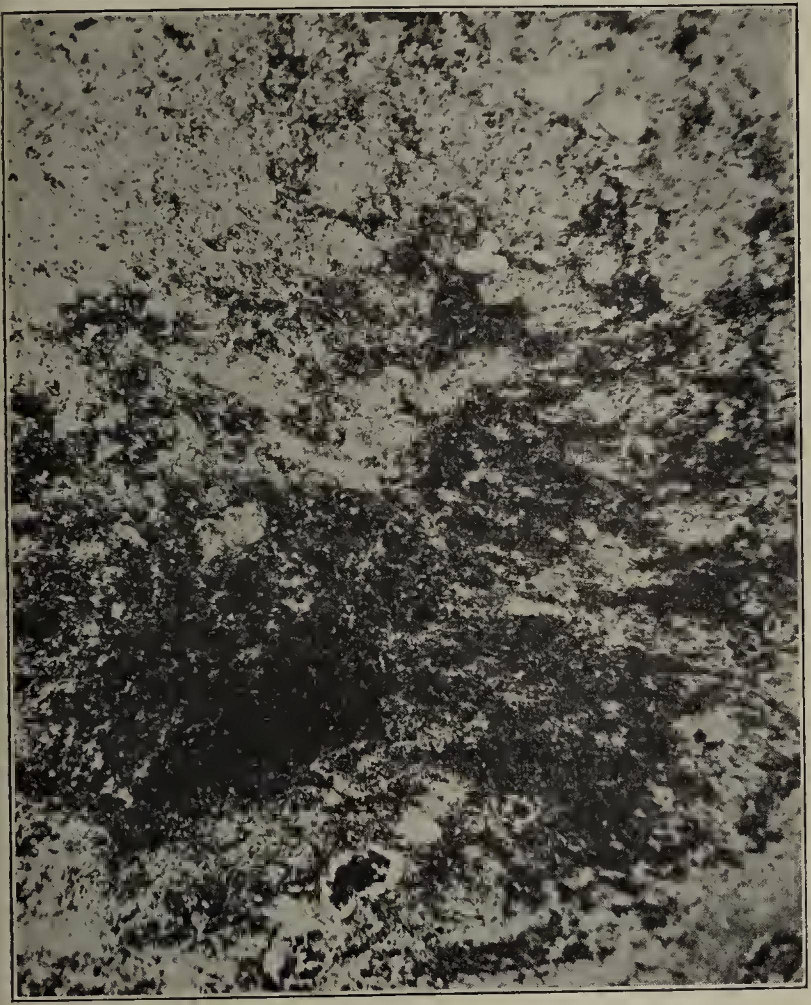

Fig. 6.—Photomicrograph (low power) of hemorrhages in the submucous tissues.

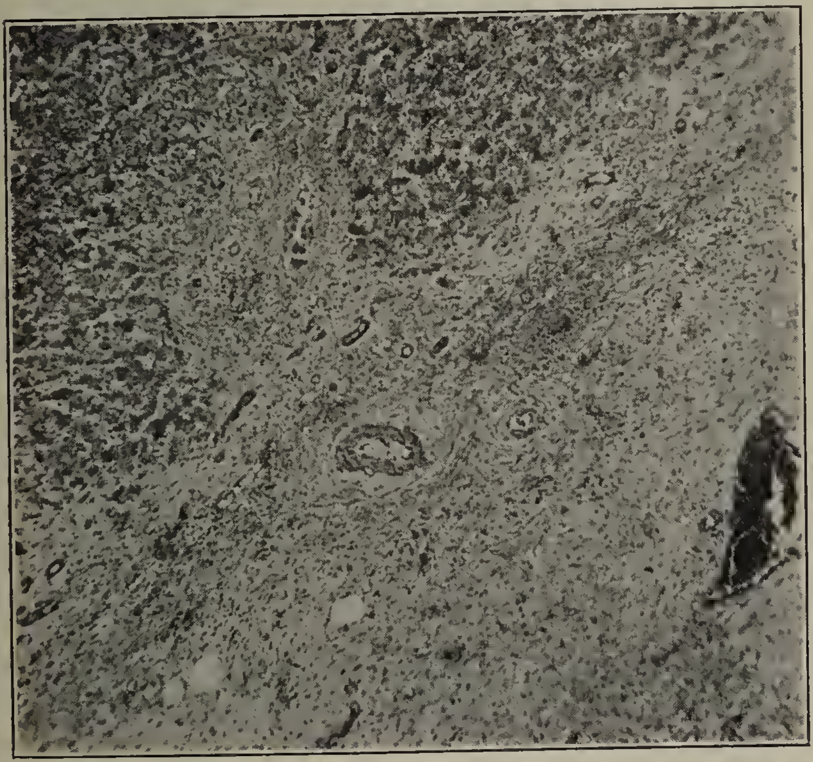

Fig. 7.—Photomicrograph (low power) showing fusion of tumor and liver structure.

Macroscopically the process had extended along the cystic and hepatic ducts following the latter into the liver substance. In places the line of demarcation between liver substance and tumor was not easily determined. The pancreas and surrounding structures were not affected, but the regional lymph glands nearest the gallbladder were slightly enlarged, firm and surrounded by thickened capsules. There were no metastases in the liver or in the other abdominal tissues.

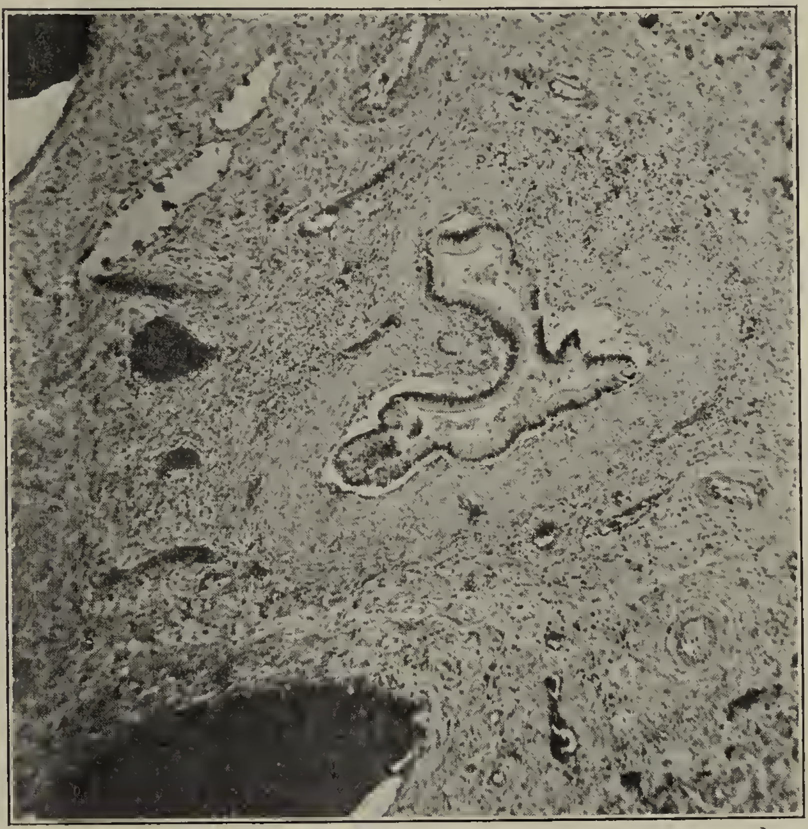

Fig. 8.—Photomicrograph (lower power) of bile duct surrounded by new formation tissue.

Microscopically the stroma of the organ was composed of densely arranged cells of connective tissue origin with spindle cells and stellate cells with long branching cytoplasmic processes (Fig. 3) in predominance. These cells were apparently rapidly

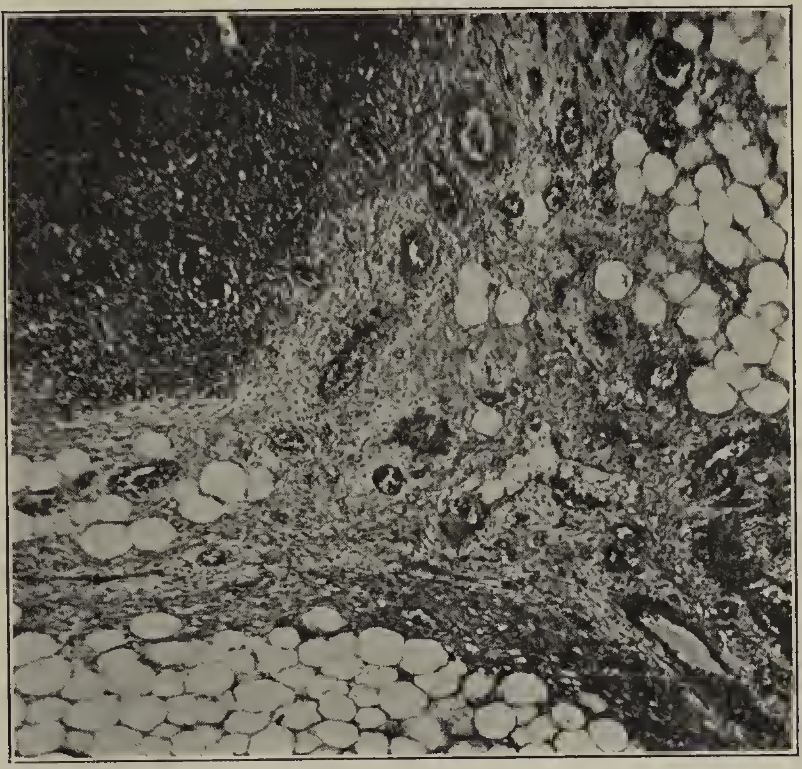

Fig. 9.—Photomicrograph (low power) showing fibromyxomatous extensions in capsule of lymph gland.

growing and although mitotic figures were not numerous there were areas in which mitosis was an outstanding feature. In patches there was an abundant production of mucin filling the cavities between the strands of fibrils and here also there were numerous large round or oval cells with small eccentric nuclei, and a cytoplasm filled with globules of mucin and yellow granules (Fig. 4).

Thin walled bloodvessels were numerous and congested and the perivascular areas of the larger vessels were strikingly densely cellular. A few areas of blood pigment deposits were noted, and frequently patches of fat tissue construction were encountered.

Sections through the mucosa showed a few remnants of this structure which was extremely irregular and papilliform (Fig. 5). The few existing mucosal cells were in various stages of degeneration and many were imbedded in sclerotic surroundings. There was considerable necrotic material along the surface and the submucous tissue showed dense sclerosis, many hemorrhages (Fig. 6), round cell infiltration and mucin productions.

Sections taken at the margin of the tumor and liver substance (Fig. 7) disclosed the fact that in general the line of demarcation was rather distinct and was accentuated by a marked round cell infiltration of the adjacent liver substance, but in many places there was direct invasion of the liver tissue by the tumor cells; however, the infiltrations were neither deep nor extensive. The portal areas of the adjacent liver substance were greatly enlarged by myxomatous connective tissue, round cell infiltration, thickened arterioles and new formation vessels.

The larger bile ducts were surrounded by the same type of tissue described for the main body of the tumor, there being plenty of mucin, branching cells and new formation vessels (Fig. 8). The deeper liver substance showed only a moderate general fibrous thickening of the portal areas, while the hepatic cells exhibited widespread fatty and granular alterations, and many were multinucleated. All vessels were thickened.

The new formation tissue filled the capsules of several regional lymph glands in the gallbladder area and invaded the substance of the glands to a moderate degree. These thickened capsules contained the same type of cells found in the main tumor and the same general tissue reaction was present.

In patches there was considerable invasion of the lymph glands, apparently true extensions of tumor, but there were no actual metastases or isolated growing points seen. This was possibly the ordinary but exceptionally rapidly growing productive tissue extending through the capsules of the lymph glands and into the substance.

COMMENTS.

1. All of the cases of socalled sarcoma of the gallbladder and a great majoriity of cases of primary carcinomata (5) of this organ have been preceded by gallstone formations and often by suppurative cholecystitis; however, regardless of these facts, the comparative rarity of primary tumors (6) and our experience with gallbladder conditions among the insane lead us to believe that the connection between cholelithiasis and these tumors is overestimated. In the sedentary population of hospitals for the insane, chronic gallbladder conditions are among the most frequent autopsy findings, and in the general surgical clinics of these hospitals gallbladder operations are very numerous, so that in the pathological service at St. Elizabeth's Hospital, gallbladder tissues constitute a large part of the microscopic material.

2. Since there were no metastases and as the infiltration was notably limited we hesitate to classify the described tissue change among the primary sarcomata of the gallbladder, although we are of the opinion that some of the reported cases of gallbladder sarcoma are of this nature. Dr. James Ewing (7) considers our case to be one of unusually extensive chronic productive cholecystitis with marked overgrowth of cellular connective tissue. Regardless of the nature of this growth whether an inflammatory reaction or a neoplastic growth it certainly is an infrequent response to either acute suppurative cholecystitis or to cholelithiasis, the usual outcome being a dense fibrosis with final contraction even to obliteration of the sac, the stones occasionally being removed with great difficulty or, as sometimes happens, a complete calcification of the gallbladder walls.

3. In the face of these facts and since our tumor exhibited rapidly growing branching cells with mitotic figures, mucin productions and some tendencies to infiltrate the capsules of the regional lymph glands, we are of the opinion that the growth closely approached the myxosarcomatous type which usually shows less tendency to metastasize than many of the other forms of malignancy.

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Elizabeth's Hospital.

Effect of Magnesium Sulphate on the Liver and Biliary Apparatus

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The object of this experimental investigation was to ascertain the pharmacological effect of magnesium sulphate on the biliary secretion of the liver. The effect of natural mineral waters that contain this salt on the bile formation and the bile secretion has been studied and known for a long time in those resorts that are a refuge to the liver sufferers; in this country, Bedford, Pa., and in Europe, Carlsbad. In fact, it can be said that Carlsbad water is known for its hepatotropic effect since 1347, and to anyone who has observed cases of pre or postoperative cholelithiasis there, or at Bedford, Pa., must be impressed that something in these waters increases the secretion or expulsion of bile or both.

My thoughts reverted to these experiences, gained at these two resorts, when I witnessed the gradual evolution of the method of duodenal intubation, which was first proposed by me (1) in 1895.

It has become a matter of great clinical importance to know the modus operandi of magnesium sulphate, and there are so many questions of pharmacological interest in this connection that we have to circumscribe the entire problem by precisely defining the experimental inquiry. Does magnesium sulphate act primarily upon the excretory biliary apparatus, i. e., the muscles and nerves of the gallbladder and the sphincter muscles, ganglion cells and nerve endings in the sphincter of Oddi which encircle the outlet of the common gallduct in the duodenum; or, does the magnesium sulphate act upon the liver cells themselves, stimulating them to an increased formation of bile? A sharp distinction between these two inquiries is, strictly speaking, not possible, because in the ordinary method of taking magnesium sulphate in solutions, it is possible that both these pharmacological effects can take place; that is, there may be a local primary effect upon the biliary expulsion apparatus, and also a diffuse, more general cholegogue effect upon the liver cells. The question, then, is magnesium sulphate mainly a stimulant to the excretion of bile that is already formed, or is it mainly a true cholagogue? This question has assumed importance because a number of American clinicians, especially B. B. Vincent Lyon (2), have separated the bile which is obtained after injecting a thirty per cent. solution of magnesium sulphate into the duodenum into three portions; first, that which comes from the common duct; second, that which comes from the gallbladder; and third, that which is freshly secreted by the liver. These three different segregations of bile Dr. Lyon designates as the A, B and C bile, and on the chemical, physical, cytological and bacteriological investigations of these three different bile segregates he has developed a method of clinical diagnosis which is as admirable as it is full of promise.

I have become convinced, after many demonstrations, which Dr. Lyon made in my presence, and which I personally have executed on my own patients, that in a normal biliary apparatus, or one that is not so abnormal as to prevent the expulsion of bile entirely, the three types of bile can be withdrawn through the duodenal tube in the manner he describes. The question is, "cannot the same three segregations be ascertained after duodenal injection of magnesium sulphate, when there is no gallbladder present?" This question is answered in the affirmative by Einhorn (3), and in a very illuminating article by Arthur D. Dunn and Carl Connell (4). The case which these two clinicians studied is of extraordinary interest, both from the viewpoint of surgical technic (the patient was operated on fourteen times), as well as from the viewpoint of clinical diagnosis. Experiments carried out on this patient without a gallbladder or common duct resulted in the withdrawal of typical A, B and C segregations of bile after introducing a thirty per cent. magnesium sulphate solution into the duodenum. Three hundred c. c. of a thirty per cent. solution were introduced into the colon by the rectum and the bile collected through the duodenal tube. All fractions of this bile were alike, except that some were acid and turbid from admixture of stomach secretion; this same form of homogeneous A, B and C bile was obtained when the duodenal tube was introduced in the morning on a fasting stomach, without the magnesium sulphate injection; all three biles—A, B and C—were then alike. This, and other experiments, were repeated in such a manner that the intestinal tube was passed thirty-two cm. through a duodenal fistula into the jejunum and its position verified by the fluoroscope and by plates; 100 c. c. of a thirty per cent. magnesium sulphate solution was injected into the jejunum and the catheter was washed with physiological saline solution; it was then withdrawn, cleansed and reinserted into the duodenum. This technic showed that in a case without gallbladder or common duct, typical A, B, C bile could be obtained by injecting thirty per cent. magnesium sulphate solution into the jejunum, thirty-two cm. distant from the second portion of the duodenum.

I have repeated this experiment on a normal person with the intestinal tube, the instrument being introduced through the mouth and the esophagus, cleansed with distilled water after it had been inserted, or rather, reached a distance of forty cm. below the duodenum. The results in this individual were exactly those described by Dunn and Connell. I have also repeated their experiment No. 3 (6), where magnesium sulphate was introduced into the colon, but here my results are different from those of Dunn and Connell. While all of their types of bile were alike, except for the admixture of stomach content, I found that after a withdrawal of about eighty-two c. c. of thick viscid bile, I gained 320 c. c. of clear yellow bile of a much lower specific gravity and viscosity during the following three hours.

I presume that for some unknown reason the magnesium sulphate in the case of Dunn and Connell was not absorbed from the colon, or that they did not give time for absorption. The rate of absorption from the colon, like that from the rest of the digestive tract, varies in different persons, both in health and disease, but if time enough is given and the magnesium sulphate is not expelled from the colon, it will be found that it can be detected in the bile drawn through the duodenal tube in from forty to sixty minutes.

THE PHARMACOLOGICAL EFFECT OF MAGNESIUM SULPHATE ON THE LIVER CELL.

Part of these experiments were executed in the Laboratory of United States Bureau of Fisheries, Wood's Hole, Mass., on the livers and gallbladders of a dog fish which will be published later. The mammalia used were four cats and four dogs. The experiments on human beings were conducted on persons in my practice.

In all experiments on human beings, to ascertain the direct effect of magnesium sulphate on the liver, two conditions must be observed: first, the diet of the person experimented on for forty-eight hours previous to the experiment must be exactly known; secondly, the amount of bile pigments excreted in feces and in urine must be known under normal conditions. These two points being ascertained, the quantitative determination must be made for bile pigment, hydrobilinogen and hydrobilirubin both on the feces and on the urine.

Under normal conditions, the feces of adults contain only hydrobilinogen and hydrobilirubin. In a great many hundred analyses executed during the last twenty years, I found that the fresh, or recently evacuated feces, if they are protected from light, contain only hydrobilinogen and either no hydrobilirubin whatever or only traces of it. With the stools of newly born children, the condition is different. Here the evacuation contains only bilirubin, or bilirubin mixed with biliverdin, which is explained by the absence of putrefactive processes in meconium of nursing children.

The first appearance of hydrobilirubin has been found to occur on the third day after birth by Müller (7). This author also found hydrobilirubin in the feces of starving human beings. It is very probable that from time to time bile is secreted and expelled into the intestine even when the subject takes no food whatever for several days. Such phenomena have been described from experiments in Pawlow's laboratory.

Concerning the quantitative relation of hydrobilinogen to hydrobilirubin, it can be stated that the longer the stool is allowed to remain undergoing spontaneous putrefaction and fermentation before it is analyzed for these substances, the more hydrobilirubin will be formed. For practical purposes, it is best to examine the stool after a diet which yields only hydrobilinogen. I have found human subjects who will yield such stools after a diet consisting exclusively of beef tea and dry bread. Such a find will greatly simplify the analyses and the deductions to be made from the effect that magnesium sulphate will have upon the amount of bile pigments in the stool.

In certain pathological stools, a rare pigment is formed which is called cholecyanin. The process of reduction of bilirubin may go beyond the formation of hydrobilirubin to the development of hydrobilinogen, but this again, after evacuation, may be transformed back into hydrobilirubin again. The aftercoloration of freshly passed feces is due to this return of hydrobilinogen into hydrobilirubin when it comes in contact with the air. It is therefore of great importance to execute all analyses immediately after the feces are passed.

In a most scientific analytical work on the feces by Adolph Schmidt and J. Strasburger (8), the amount and the character of the diet is not stated and this deducts very considerably from the value of the analyses, and also explains the great variation which the various clinicians and chemists claim to have found in the percentage of bile pigments of the human feces. Müller (7) during a mild diet and pure protein diet found eighty-three to eighty-nine milligrams of hydrobilirubin in the feces of twenty-four hours.

Ladage (9) calculates the amount of hydrobilirubin in the feces plus that in the urine as equal to 200 milligrams a day. Eppinger and Charnas state the average amount of hydrobilinogen at .123 in twenty-four hours under normal conditions.

The quantitative methods for determining hydrobilinogen and hydrobilirubin are given in the exhaustive work on the clinical investigations of human feces by Adolph Schmidt and J. Strasburger, and the method most familiar to me is the one by Friederich Müller (7). The whole subject of fecal examination is very exhaustively treated by Hans Lohrisch (11).

All methods of quantitative determination of hydrobilirubin are difficult of execution and cannot be considered exact because hydrobilirubin is a readily decomposable and changeable compound. All methods do not yield pigments of uniform composition. Even though the optical qualities of these pigments may agree, yet they may differ in composition. Friedrich Müller's original method aimed at the isolation of urobilin from the urine. Formerly it was assumed that the hydrobilirubin of the feces and the urobilin of the urine were identical. Now we know that that is not the case, for according to Maly, hydrobilirubin contains 9.45 per cent. of nitrogen; urobilin, however, according to Garrod and Hopkins, contains 4.11 per cent. of nitrogen. Such chemical compounds may be alike in their spectral properties but different in their percentage content of nitrogen.

The diet which was used in my observations was the socalled Schmidt intestinal test diet, which totals 2,234 calories. It consists of 1.5 litres of milk, one hundred gr. of zwieback, two eggs, fifty grams of butter, 125 grams of tender beef, 190 grams of potatoes (puree), eighty grams of oatmeal gruel with about three grams sodium chloride. The potato puree is made of ground boiled potatoes, 190 grams, one hundred grams of milk, ten grams butter and a little sale. The diet is described on page five of his work on the feces of man.

A normal human subject, weighing 170 pounds, aged fifty, on this diet formed 140 milligrams of hydrobilirubin, having one evacuation in twenty-four hours; in the urine of twenty-four hours a further thirty-six mg., a total of 176 mg.

When 100 c. c. of a 30 per cent. solution of magnesium sulphate was given by the mouth, there were three evacuations in twenty-four hours, totaling 210 mg. of hydrobilirubin in the feces and 74.5 mg. of hydrobilirubin in the urine. Unchanged bilirubin may occur in the stool when magnesium sulphate is given. When the magnesium sulphate is injected into the colon through a high colon tube it must be diluted until it is almost isotonic with the blood; it is then retained more easily. A concentrated solution of magnesium sulphate may also be retained by the colon, but this is rather exceptional. If it is desired that the magnesium sulphate should be absorbed and reach the liver, it is advisable to dilute it in successive experiments until that degree of dilution is obtained which is best tolerated by the colon.

Magnesium sulphate if thus absorbed by the colon can be detected in the duodenal bile obtained through the duodenal tube in between fifteen and twenty minutes. The hydrobilirubin and also the hydrobilinogen in the stool are increased in a similar manner, though not in the same degree, in the feces as when the magnesium sulphate is taken by the mouth.

In giving salts into the lower bowel, it must be borne in mind that the rectum and lower sigmoid are supplied with veins that form the plexus hemorrhoidalis and from this the circulation leads into the hypogastric vein into the internal iliac directly into the greater circulation; but if it is intended that the salt shall reach the liver, it must be introduced up high into the colon; only from here can it reach the portal circulation.

The difference in the effect of concentration of this salt and the water binding power of different concentration has an influence on the rate of the intestinal peristalsis, so that for example, a concentrated solution of magnesium sulphate, say twenty per cent. does not produce diarrhea until twelve to twenty hours have passed, because it attracts water from the body; but a diluted solution, for instance, a five per cent. solution, may cause diarrhea in two hours. If the experiments are to be conducted under the observation of all pharmacological particulars, it is best to study the reaction on the same individual repeatedly with different concentrations, and note the time of the first evacuation.

MAGNESIUM SULPHATE INTRODUCED THROUGH THE DUODENAL TUBE.

When magnesium sulphate is introduced through the duodenal tube, two effects have to be borne in mind: first, the immediate effect that produces a relaxation of the sphincter of the papilla of Vater, the socalled sphincter of Oddi. The neuromuscular arrangement between this sphincter and the gallbladder is such that when the sphincter at the outlet of the gallduct opens, the musculature of the gallbladder contracts, and vice versa, when the sphincter of Oddi contracts, the gallbladder relaxes (Doyon). The first effect of magnesium sulphate injected into the duodenum is to produce an evacuation of the bile already collected in the common gallduct and in the gallbladder. The gallbladder once emptied, immediately a refilling of this receptacle begins from the intrahepatic larger bileducts.

The liver is a contractile organ and it is not necessary that bile should be formed anew at the beginning in order to fill an emptied gallbladder. There is enough ready formed bile in the larger intrahepatic bile vessels to fill the gallbladder completely a second time without assuming that the second filling is due to newly formed bile.

Now when the gallbladder is emptied a second time, and the liver having now emptied its larger biliary vessels, a new formation of bile takes place and this can occur when the magnesium sulphate is injected directly into the circulation.

EXPERIMENTS WITH ANIMALS.

This series of experiments was carried out on the sand shark carcarias littoralis and the dog fish (Mustelus). They will be reported in detail later.

The effect of injections of magnesium sulphate was compared with injections of sodium chloride, calcium chloride, potassium bicarbonate and Ringer's solution. It was found that magnesium sulphate causes an increase in the flow of bile, closely analogous to that observed in the human being or the dog fish. It was found that Ringer's solution has no appreciable effect on the flow of bile, but that calcium chloride and calcium carbonate diminish the flow of bile. The bile was collected by tying a short glass cannula into the common gallduct, the end of the cannula being inserted into a small rubber balloon. This was tied water and air tight, the abdominal incision of the animal closed air and water tight also and the fish then replaced in the aquarium.

These experiments demonstrated that on the selachian liver magnesium sulphate exerts a similar pharmacological influence as it does on mammal.

The examinations for hydrobilinogen are best done according to the methods of Charnas (10).

Some of the hydrobilinogen passes over into hydrobilirubin in using this method; about ten per cent. has to be thus accounted for in making the final calculations. These determinations, which eventuate into a spectroscopic examination, require experience, and if one has not had this personal experience, it is best to have them carried out by a professional chemist. Some of these determinations were made with a test meal consisting simply of beef bouillon which is a satisfactory meal in case no obstruction in the tube during the drawing of the duodenal contents is desired, because the duodenal tube is of such small calibre that it is readily obstructed. It is, however, not a physiological test meal to give simply the soluble salts of beef, because these bouillons contain only traces of protein, and no fats whatever. This may explain some of the great variations in the alkalinity of the duodenal contents, which was also evidenced in the degree of proteolysis, amylolysis and lipolysis reported by various investigators.

I found when a test meal was given consisting of the Schmidt test diet, consisting of bread and oatmeal gruel, that much more constant and homogeneous figures are arrived at for both the alcalinity and the three enzymes, than those reported by Max Einhorn (11). It is true the difficulties of drawing a duodenal test meal after solid food has been eaten are very great; at times it is impossible to draw any of the duodenal contents. Here two things can help the clinical experimenter. In the first place, an effort must be made to get the patient to pass a tube as large as the rubber catheter numbered 16-F, 9-E, 11-A. There are patients who can pass this through their pylorus without difficulty. Then, secondly, the patient must be cautioned to chew the bread very finely or otherwise it should be taken in the form of a bread soup, meaning dry bread rubbed up and boiled with bouillon. Soup made with noodles or rice corresponds very closely dietetically to the bread soup.

When these precautions are taken and when the clinician is dealing with an experienced patient, the results become more and more constant, at least in normal cases.

Amounts of hydrobilinogen and hydrobilirubin in feces and urine after injection of magnesium sulphate—human gastric filtrate and of the subject's own duodenal contents after bile flow has been started by magnesium sulphate or gastric juice injected into duodenum.

Average of six determinations:

	Feces		*Urine*	
	Hydrobilirubin	*Hydrobilinogen*	*Hydrobilirubin*	*Hydrobilinogen*
Injection of 30 c.c. of 30 per cent. magnesium sulphate solution....	2.10 Mg.		74.5 Mg.	
Injection of subject's own gastric filtrate	306 Mg.		78 Mg.	
Injection of duodenal contents gained two hours after bile drainage was started by injecting 75 c.c. of a 30 per cent. solution of magnesium sulphate into duodenum.........	112.56 Mg.		14.23 Mg.	

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The Therapeutic Value of the Duodenal Tube*

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A small rubber tube ending in a perforated metal capsule and used for aspirating the duodenal contents has been named the duodenal tube. Much credit is due Einhorn, Gross, Palefski, Jutte and Rehfuss for the practical application of this tube in clinical medicine.

The long rubber duodenal tube has several markings. One black ring (I) at forty centimetres from the distal end indicates the position of the cardia, that is to say, when the swallowed tube shows the mark I at the patient's teeth the tube itself has progressed as far as the cardiac orifice, the entrance of the stomach; two black rings at fifty-six centimetres (II) indicate the pylorus; three black rings at seventy centimetres (III) indicate the duodenum. At sixty centimetres or further the tube is assumed to be in the duodenum. That this inference is correct can be proved by attaching a simple syringe to the outer end of the tube and aspirating.

The introduction of the tube is quite simple. The perforated end is moistened with warm water and introduced as far as the patient's pharynx. The patient drinks a little water and the tube slides down into the stomach. To make sure that the tube is in the stomach we aspirate chyme by means of a glass syringe. A syringeful of clear water is then forced through the tube to wash the chyme back into the stomach; and to drive the water down, a syringeful of air is forced through. The patient is then allowed to lie on his right side, and in a short time the peristalsis of the stomach forces the tube down through the pylorus into the duodenum. If the tube is left undisturbed it will pass farther down in the small intestine. When the tube has gone down to the III mark, and is therefore in the duodenum, we can aspirate a clear golden yellow or a thick opaque liquid of alkaline reaction. If, however, the tube is in the stomach, we obtain a watery liquid resembling the first chyme removed. Air forced through the tube when the latter is in the stomach will be felt by the patient very plainly; but if the tube is in the duodenum or jejunum, no sensation is experienced as the air enters.

To determine the position of the tube the x ray can be used at any time, but the milk test is simpler: The patient takes a few swallows of milk when the tube is supposed to be in the duodenum. We then aspirate, and if the tube is in the duodenum we get a clear golden yellow liquid without any admixture of milk; if the end of the tube is in the stomach, we withdraw milk.

By the aspiration method of removing the duodenal contents we are able to accomplish a great deal in diagnosis. We can easily ascertain the functional activity of the pancreas and the presence of bile and succus entericus. The enzymes can be studied, and a specimen of the duodenal contents secured for bacteriological examination. The differential diagnosis of pylorospasm, pyloric stenosis, duodenal obstruction and duodenitis can thus be made.

The duodenal tube is being used for the direct treatment of pyloric and duodenal ulcers. Nitrate of silver may be applied directly to a gastric or duodenal ulcer by means of the duodenal tube. The spot on the tube that is to come in contact with the ulcer is painted with a thirty per cent. solution of nitrate of silver and allowed to dry. To locate the ulcer the string test is used. This test consists in finding a stain of blood on a white silk string. Originally, an Einhorn duodenal bucket was attached to a piece of braided white silk string. I have found that a porcelain bead answers the same purpose as the duodenal bucket. In preparing for the test, a porcelain bead the size of a large pea is tied to a white silk string eighty-five centimetres long; and a small rubber band is fastened to the other end. A knot is tied at forty centimetres from the bead, the distance from the incisor teeth to the cardia. The rubber band is attached to the ear to prevent the string from passing through into the intestinal canal. The patient swallows the bead with a little water at night just before going to bed and allows it to go a little beyond the knot, so that it is in the stomach. By morning the stomach peristalsis will have pushed the bead down into the intestine, and the rubber band around the ear holds it taut. Before removing the string, another knot is tied in it—at the incisor teeth. As the bead is being withdrawn it will be found to catch at the cricoid cartilage. The patient is then asked to swallow, and while this act is taking place withdrawal of the bead is easily accomplished.

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Examination of the string will show that the lower end is colored yellow or greenish yellow, due to contact with bile. This is an important point, for it proves that the bead has been in the duodenum. Should there be no yellow stain we know the bead did not pass through the pylorus—that the string has either doubled upon itself or met with an obstruction, perhaps a contracted pylorus. If the bead does not pass through the pylorus the first night, a smaller bead can be used the following night, and this procedure repeated until one enters the duodenum. The white string is always to be carefully examined for a red or brown stain which tells us definitely that an ulcer is present. The string being directly in contact with any raw surface becomes stained at that spot with blood. By measuring the string from the indicating mark made at the incisor teeth to the blood stain we are able definitely to localize the ulcer. If we find the stain thirty-nine to forty-three centimetres from the incisor teeth, this shows that the ulcer is at the cardia; if forty-five to fifty-four centimetres, the ulcer is located at the lesser curvature; if fifty-five to fifty-eight centimetres, it is at the pylorus; and if over fifty-nine centimetres, in the duodenum. By making the test several times on the same patient we secure cumulative proof; if at each test a red or brown stain is found at about the same distance from the incisor teeth, it is certain that a lesion of the mucosa, which is probably an ulcer, is present. By applying the silver nitrate solution on the tube at the same distance as the blood stain on the string, direct therapeutic application is made to the ulcer.

Amebic dysentery has been successfully treated by large doses of ipecac poured directly into the duodenum without irritating the gastric mucosa.

Intestinal decomposition can be prevented by insufflation of oxygen into the bowel through a duodenal tube. Favorable results are accomplished in fermentative and putrefactive catarrhs. Two insufflations of oxygen a day exert a destroying influence on the pathogenic anaerobic bacteria. Pain and annoying abdominal symptoms quickly subside. Two to four litres of oxygen are introduced. When introduced slowly it never inconveniences the patient. Colic or peristaltic unrest does not occur. In one to two hours odorless flatus passes through the anus, showing that the oxygen has passed the whole length of the large intestine.

The nonsurgical drainage of the gallbladder and biliary ducts by the use of the duodenal tube is now an accomplished fact. Meltzer observed that a twenty-five per cent. aqueous solution of magnesium sulphate in the duodenum relaxed the intestinal wall and the papilla of Vater. Following the law of contrary innervation, the muscles of the gallbladder contract, causing a continuous flow of bile to the duodenum. In diseases of the gallbladder and biliary ducts, nonsurgical drainage with magnesium sulphate removes all biliary stasis, eliminates infection, and reduces gallbladder and bile duct inflammation. Kehr recently stated before the Berlin Medical Society that eighty per cent. of all galltract diseases respond to internal treatment. By this new method of draining of the biliary ducts the percentage of cures by the internist will be greatly increased.

Duodenal lavage is used in the treatment of chronic biliary and intestinal stasis and chronic constipation, intestinal fermentation and putrefaction, cholecystitis, bronchial asthma, arthritis, arthritis deformans, and gout. After the tube has been introduced into the small intestine in the usual way, it is disconnected from the syringe and the end attached to an ordinary irrigator or rubber bag containing one thousand c. c. or one litre of irrigating fluid. The patient sits up and the fluid flows slowly into the bowel, about fifteen minutes being allowed for this to take place. There is usually no discomfort or distention of any part of the intestine. Should there be any pain or distention, the flow of the fluid should be discontinued temporarily. After all of the fluid has been allowed to flow into the intestine, the duodenal tube is gently withdrawn and the patient rests for a while. Within an hour or two he will have a copious movement of the bowels. When it is desired to cleanse the bowel thoroughly, the irrigating fluid should contain thirty grams (one ounce) of magnesium sulphate and sixty grams (two ounces) of sodium sulphate to one litre of water. To flush the kidney, plain water is sufficient. In cases of icterus and when fat digestion is impaired, 0.5 gram of pure castile soap to one thousand c. c. of normal saline is beneficial. The fluid introduced should always be at body temperature.

Among other diseases which have been reported to be successfully treated by duodenal lavage are sciatica, arteriosclerosis, epilepsy, nephritis, cirrhosis of the liver, neuralgia, neuritis, anemia, skin diseases, eye diseases, insomnia, melancholia, dementia, and insanity. In view of the fact that so many diseases are caused by the absorption of toxins from the intestinal canal, it is not surprising that flushing out the intestine accomplishes such good results.

When we have a condition of kinks, bands, adhesions and adventitious membranes causing intestinal stasis, duodenal lavage is absolutely safe and may accomplish a great deal.

Duodenal alimentation has accomplished very much in the treatment of gastric and duodenal ulcers. My results with this method of treatment have been exceedingly good. Gastric and duodenal ulcers will heal rapidly if we can give the stomach absolute rest. This is best accomplished by feeding the patient directly through the duodenal tube into the duodenum. The tube is passed in the same manner as for aspirating the duodenal contents. Just as soon as there is no doubt that the end of the tube has passed beyond the pylorus, feeding is begun. The food should be introduced very slowly, always at body temperature, and at two-hour intervals. After each feeding, water should be forced through the tube, and afterwards a little air to expel the contents of the tube into the duodenum, after which the stopcock attachment of the tube is closed. The tube can remain in the digestive tract twelve days or longer without causing any irritation or discomfort. The portion of food introduced every two hours consists of 240 c. c. (eight ounces) of milk, one raw egg, and fifteen grams (half an ounce) of sugar of milk, all well beaten. When more water is to be introduced, proctoclysis can be employed. The case here cited illustrates the value of duodenal alimentation for gastric ulcer:

Case.—Miss W., aged twenty-seven years, occupation, maid; born in United States; normal weight 160 pounds. Her mother was living, father died of gastric hemorrhages from ulcer, and one sister died of obstruction of bowels. Her appetite varied; bowels were constipated; sleep was fair; menstrual periods were painful at times. She had had scarlet fever in childhood, tonsillitis frequently, and at the age of twenty she had had an operation for retroversion. She had hemorrhoids at time of examination.

History of gastric disturbances: The patient had had stomach trouble when sixteen years of age; severe pain in epigastric region from thirty minutes to two hours after eating, not referred. Bicarbonate of soda gave relief. She had attacks of vomiting, which did not relieve the pain; blood was vomited at this time. There was a severe burning sensation in the stomach. The patient had these attacks of pain almost daily; longest time free from stomach trouble was three months after operation. At the age of twenty-one she received about fifty gastric lavages. From that time up to twenty-five she was troubled almost daily with the symptoms mentioned. At twenty-five she had a very severe attack; pain was terrific as soon as she ate or drank anything —epigastric in location, not referred. She vomited dark blood with a few clots, and was in bed two weeks. Ice bags locally and silver nitrate by mouth brought relief. She kept up the silver nitrate internally for about three months, and was free from stomach trouble for about eight months, when it returned as severe as previously except that there was no blood in vomitus. She suffered from pain, vomiting, burning in stomach, eructations, constipation; always had to take a cathartic; epigastric region was tender to the touch. Vomiting did not ease the pain. After food, pain would subside for a few minutes and then return, causing increase in vomiting.

Her physician had tried bismuth, silver nitrate, alkalies, diet, and every possible method, without any improvement in her condition. She refused surgical intervention, and thus the only resource left was duodenal feeding. With this treatment in view she entered the hospital on May 1st. The duodenal tube was introduced on May 2d. The patient was given the following combination every two hours: 240 c. c. (eight ounces) of milk at a temperature of 90° F., one raw egg, and fifteen grams (one half ounce) of sugar of milk. This mixture was strained before being introduced into the tube. It was given very slowly, twenty minutes being taken for each feeding. Each feeding was followed by two syringes of warm water and one of air. This was done to cleanse the tube and remove all traces of food which might decompose.

These feedings were given every two hours daily until May 5th, when the patient complained of distress after the feeding. The tube was withdrawn about eight inches. Water was given by mouth, and the patient instructed to lie on her right side so as to carry the tube back into the duodenum. The tube feedings were resumed at two hour intervals; when introduced rapidly, the patient complained of distress, nausea and pain, showing that the duodenum was being too rapidly distended. The x ray showed the end of the duodenal tube in the duodenum.

The tube remained in the duodenum until May 27th. At this time there was no epigastric pain, burning or vomiting. The tube was withdrawn and feedings of the same mixture were given every two hours by mouth for two days. This did not cause the patient any discomfort or induce any disagreeable symptoms. Since that time the patient has gradually improved and is now free from her previous discomfort.

Since the duodenal tube can remain in the digestive tract for a long period of time without discomfort, the whole cycle of gastric digestion can be easily studied with its aid. The tube, introduced with the test meal, should be so fastened that it cannot go beyond the II mark. This is to make sure that the lower end will remain continuously in the stomach. Some of the stomach contents can be aspirated every fifteen minutes and the progress of digestion examined by fractional analysis. The secretory curve can be easily studied by the fractional method and gives one a thorough insight into the complete act of gastric secretion.

The duodenal tube can be used for stretching the pylorus, a tiny rubber balloon being attached to the small metal end piece. The dilator is covered with silk gauze. The tube is connected at its upper end with a stopcock and a graduated glass syringe for inflating the balloon with air.

The pyloric dilator is introduced in the same manner as the duodenal tube. The tube is left in over night and in the morning the lower end is usually in the duodenum. Before stretching, it is necessary to ascertain whether the dilator is in the duodenum. The balloon is inflated by means of the syringe. If the tube be now drawn forward, there is a sensation as if the end of it were held tight by something that drags along with it, not being able to escape. We must not use much force. The balloon should be slightly deflated by reversing the piston, and if necessary this operation repeated again and again until the end of the dilator by a slight pull passes through the pylorus. The syringe being graduated, we note the number of cubic centimetres of air in the balloon during its passage through the pylorus. On withdrawing the dilator through the stomach, no resistance is felt until the cardia is reached. Here the dilator should be entirely deflated before being withdrawn. To ascertain the size of the pylorus, the same amount of air as has already been registered is forced into the tube after its withdrawal, and the circumference of the inflated balloon is measured with a Thomas adaptable gauge. A record must be kept of the amount ofg air necessary to inflate the balloon to a definite size, so that at each inflation a little more air can be introduced in order to gradually enlarge the pylorus. Inflations should take place once a week. The results in benign stenosis of the pylorus, when the end of the pyloric dilator can pass through, are very gratifying. Internal stretching of the pylorus should be attempted in all stenotic cases before inviting surgical intervention. It certainly should be used in benign pyloric stenosis complicated with grave heart and kidney lesions. In such cases the mortality of operative intervention is large, while the widening of the pylorus by the internal route can be done practically without any risk.

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Chronic Duodenal Obstruction*

Etiology, Symptoms and Treatment

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The possibility of chronic obstruction of the duodenum at the point of junction with the jejunum has been given almost no consideration by the numerous writers on visceroptosis and intestinal stasis until within the last few years. It is nevertheless certain that there are many who suffer from chronic disorders, both physical and mental, from this pathological cause. Depending on the degree of obstruction and its persistency the symptoms vary in severity from intermittent mild attacks of headache, nausea and vomiting to a constant inability to partake of any food without causing distress. The symptoms simulate duodenal or gastric ulcer in some cases while in others they resemble those of cholecystitis and appendicitis. That mistaken diagnosis of the condition has led to surgical operations for assumed trouble in appendix, gallbladder, duodenum or stomach, we know both from observation and from personal experience.

The most common symptoms of this type of duodenal obstruction are, a chronic epigastric distress, varying in time and duration, but usually most intense two or three hours after meals; nausea and emesis, often of unusually large amounts of material, including bile; constipation, and periodical attacks of vertigo and headache. All symptoms disappear for a time after a copious bile emesis. These symptoms are not constant except in the more marked cases. As a rule they come in spells with intervening periods of practically normal digestive functions. During the attack the patient may be compelled to stay in bed for a day or two, more because of the head symptoms than because of the abdominal disturbance. Certain foods and modes of living predispose to the attack. In one word the history and symptomatology of each recurrence in the milder cases correspond to the classic conception of the term "bilious attack."

When the first of the human species began to walk in the upright position, several of our internal organs were obliged to change their position because of the force of gravity. Those abdominal organs which were but loosely attached to the parietes by mesenteries gravitated downward as far as their mesenteric anchorage would permit.

The main supporting tissues or skeleton, of the intestinal mesenteries, are the bloodvessels. Between the bloodvessels is a loose areolar tissue which is normally packed full of fat, thus giving considerable thickness and stability to the structure. But when the mesenteric fat for some reason, congenital or acquired, is reduced to a minimum, the arteries are plainly seen as a succession of branching cords which hold the various segments of the intestine in place. When the body is prone, as in the case of the quadruped, the intestinal tube rests against the ventral abdominal wall and requires a mesentery of only limited width. If this same person is placed upright the intestines sink naturally toward the pelvis and a wider and longer mesentery is necessary or the entire weight of the organs must be supported by the mesentery, i. e., by the bloodvessels of the mesentery. That the mesentery of the small intestine actually is too short to permit the mass of intestines resting against the floor of the abdomen in many cases is an anatomical fact established long ago. That this mesenteric shortcoming is capable of producing serious pathological results is a fact not understood until recently.

The superior mesenteric artery leaves the aorta at the level of the second lumbar vertebra and passes downward at an acute angle. The duodenum passes between the aorta and superior mesenteric artery at the apex of this angle, and becomes the jejunum on the left side of this point. When the jejunal and ileac mesentery is long enough so that no special dragging is exerted on the superior mesenteric artery the angle of the artery is less acute and causes but little pressure on the duodenum. There is, however, in nearly every person an appreciable narrowing of the intestinal lumen at the duodenojejunal junction, and this narrowing is caused chiefly by the limitation of space between aorta and superior mesenteric artery. When, on the other hand, the mesentery is too short and therefore compelled to support the entire weight of the small intestine and its contents, then the superior mesenteric artery is put on a downward stretch and causes a compression of the duodenum, which is in excess of the normal.

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*Read before the North Dakota State Medical Association, Jamestown, North Dakota, June 2, 1922.

When an abdominal organ has failed to become properly attached to its normal position during embryonic development and when this organ therefore begins to cause an irritation to contiguous structures an abnormal, or adventitious fibrous tissue develops at the points of stress. It seems to be Nature's way of improving on a bad job. This would explain the fact that in those cases where the superior mesenteric artery interferes with the duodenal emptying function, for the reason stated, there will also be found, usually, a mass of abnormal membranous connective tissue at the duodenojejunal junction. Its original purpose seems to be to hold up the upper segment of the jejunum and thus to relieve the constriction of the bowel. But the ingrowth of connective tissue is apt to be overdone and the later result is that this membrane helps to cause an already threatened obstruction.

There is yet another cause for chronic obstruction of the duodenum. Many are born with a freely movable right colon. In such cases we find that the cecum, ascending colon, and hepatic flexure have not become firmly fixed to the posterior abdominal wall, but are hanging by a mesentery. The root of this mesentery supports the weight of the right colon and is attached above the duodenum with the colica media artery as the chief supporting structure. Duval has demonstrated both anatomically and surgically that this artery does at times, under the condition mentioned, become so tightly drawn across the front of the third portion of the duodenum that obstruction and dilatation are produced.

One of the chief causes for rightsided coloptosis is that the entire fetal mesentery is too short, which prevents the ascending colon and hepatic flexure from reaching their normal locations. In such cases there is an opportunity for both of the factors mentioned, compression by the superior mesenteric artery, and colonic drag, to become causes for duodenal obstruction in the same patient. This is the conclusion reached by Duval who is no doubt the most experienced authority on this subject.

In the milder cases with infrequent attacks, the pylorus retains its normal tonicity against a moderate distention of the duodenum, but relaxes and permits regurgitation when the obstruction causes the duodenal contents to become excessive in amount or specially irritating in character. In the more chronic and marked cases the pylorus has lost its function of controller between stomach and duodenum and the dilatation extends to and involves the stomach. This is shown by the character of the symptoms which then change from a periodical to a more or less constant condition of nausea, anorexia, eructations, and frequent bile emesis. We have found the entire duodenum dilated and the pylorus open and increased in diameter to twice its normal size in several patients on whom we have operated. In such cases considerable emaciation has taken place, and the patient is constantly in poor health. From the misery and continuous brooding over his ailment the patient becomes a neurasthenic wreck with his mind full of fixed ideas, reasonable and unreasonable, about his condition. From a careful notation of all reference to the subject of indigestion and dyspepsia, gathered from his numerous medical advisors and from medical literature, real and fake, his conversation teems with a mixture of scientific terminology and silly notions. It is extremely difficult to obtain reliable clinical history from this maze of perverted imagination.

Since the condition is congenital it is often possible to trace the beginning of the socalled bilious attacks to early childhood. Rarely have we found the first indications appear suddenly after adolescence. Visceroptosis in general, including coloptosis, is much more frequent in the female than in the male. Chronic duodenal obstruction is three times more common in women in the experience of Duval. However, in our clinic there have been as many men as women suffering from the more advanced stages of the disease.

A positive diagnosis of duodenal obstruction can be made only by means of the x ray. In the presence of a patient of the visceroptotic type, complaining of the symptoms mentioned briefly above, we should remember this lesion as a possibility by no means a rarity. In the examination it is sometimes difficult to make out the exact location and conformity of the third portion of the duodenum. The stomach is usually ptosed, and after it is filled with the barium mixture it conceals the duodenum in the anteroposterior aspect. Turning the patient sideways gives a better opportunity to visualize this part of the duodenum. When the superior mesenteric artery is the cause of the obstruction and dilatation the duodenum often becomes dislodged downward. Sometimes it is found in a pocket behind the peritoneum with its lower border near the brim of the pelvis. In other patients it bulges forward into the abdomen as a freely movable pouch which may protrude as far as the skin after the abdominal incision has been made. When the point of obstruction is located toward the second portion of the duodenum, i. e., when it is produced by the colica media artery, the duodenal dilatation is more likely to be above the transverse mesocolon, and is then more easily visualized to the right of the stomach.

Gastric, as well as duodenal residue of a barium meal after six hours is seen in the more marked cases. Each bolus of barium meal leaving the duodenal cap passes normally through the entire duodenum in a few seconds. If the passage is delayed so that the second and third portions are constantly visible during the emptying of the stomach, it means an abnormality. When this is found in conjunction with the symptoms described we may know that there is an interference with the emptying of the duodenum. Further x ray observations will usually prove or disprove the presence of ulcer, ptosis and dilatations.

The milder cases of periodical symptoms from duodenal obstruction are managed with fair success by teaching the patient to assume the knee-chest or Trendelenburg posture whenever the obstructive symptoms appear. It may be required to lie down with the lower abdomen elevated for one half hour or an hour after each meal until the attack is over.

In more troublesome cases the patient will learn the advantage of the recumbent position after meals for a considerable period of time. The inverted posture causes all abdominal viscera to gravitate toward the stomach, and all weight and drag across the duodenum is temporarily removed. If this is practised every time the duodenum is called into its most active service it will have a chance to regain its tone after a time, and serious damage to the duodenal walls may be obviated.

If the dilatation already is of advanced degree, and surgical operation is to be avoided, it becomes necessary that the patient stay in bed for a few weeks. During this time several hours of each day is spent in Trendelenburg posture. All patients with a tendency to duodenal obstruction, with or without right coloptosis, should be instructed to wear a pad properly adjusted over the lower abdomen. The pad must be made to fit the patient and applied with corset or binder while in the Trendelenburg posture. The object is to press the lower segments of the abdominal muscles deeply into the pelvis so that the lower abdomen may thus become materially reduced in capacity and the ptosed organs therefore be obliged to find a higher resting place. This is much easier of accomplishment in the average female than in the male who usually has strongly developed abdominal muscles and whose occupation often precludes the necessary rest. That the properly adjusted pad gives desired relief to patients afflicted with both right coloptosis and evidence of duodenal obstruction is attested by many who wear it daily as part of their necessary equipment for comfort.

When it becomes advisable to resort to surgical operation for the relief of the disease, a thorough examination of all organs in the upper abdomen must be made after incision. The condition of the stomach, pylorus, gallbladder, and first and second portions of the duodenum must be ascertained. The situation of the right colon is of great importance. In many cases, perhaps in the majority, it will be found that when a ptosed right colon is properly affixed to the right flank the evident cause of the obstruction is removed by taking the weight off the transverse mesocolon. In others it will be found that the hepatic flexure is already fixed fairly high so that the colonic drag across the duodenum therefore can not be great. If the duodenal dilatation at the same time extends to the junction with the jejunum it is almost a certainty that no form of treatment will give the relief which follows a duodenojejunostomy.

This shortcircuiting operation is made on the left side of the prominent, dilated and descended third portion of the duodenum. Since the ptosed duodenum usually slides about somewhat freely under the peritoneum, it is necessary first to incise the peritoneum and to withdraw a section of the organ. The right colic artery and one or more large veins pass obliquely to the right at this point, and care must be exercised that they be not damaged. A number of large soft lymph glands may be noted close to the vessels. These should be molested as little as possible. If the duodenal wall has become definitely infected, a condition present in the very chronic cases, areas may be found where the peritoneum has become firmly adherent to the thickened duodenum. With such findings the possibility of wound infection must be borne in mind and application of alcohol or tincture of iodine to the suspected and incised surfaces is advisable. The jejunal loop selected should be the highest segment which will reach to the point of anastomosis without tension. In some cases we have found the jejunum abnormally diminished in diameter, a proof of its decreasing amount of exercise. The anastomosis is made on the same plan as a gastroenterostomy. It is more easily made because the duodenum has a much thinner wall and contains fewer bloodvessels than the stomach. When the duodenum is opened it will be found to contain considerable bile and, especially in the more chronic and advanced cases, a quantity of gas. The opening into each loop should be at least three cm. long, and in the presence of great dilatation two or three cm. longer. The anastomosis is made with two rows of tannic or chromic catgut, the outer taking in merely the outer muscular coats and the inner all the layers. We make the latter with a running interlocking suture, for which we have a specially constructed needle. Lastly, the free and retracted peritoneal margin is attached to the suture line and the small opening between the duodenum and jejunum above the anastomosis is closed.

When the obstruction is confined to the second portion of the duodenum, i. e., when it is caused by coloptosis, the dilatation does not extend below the mesocolon, but the abnormal bulging of the duodenum can usually be plainly seen through this structure after the transverse colon has been raised. Our experience has indicated that most patients with this form of duodenal obstruction are relieved from the symptoms by making a complete colofixation by the method described by me elsewhere. If it is evident that the colofixation does not lift the weight of the colon efficiently from the duodenum, a transmesocolic anastomosis should be made between the jejunum and the second portion of the duodenum to the right of the colica media artery. Duval recommends making the anastomosis entirely above the transverse mesocolon by pulling the jejunal loop through an incision in the mesocolon. The anastomosis is then supplemented by a submesocolic jejunojejunal short circuit. The three anastomoses we have performed on the second portion of the duodenum were made before the appearance of Duval's article on the subject. We followed the same technic already described for anastomosis on the third portion of the duodenum, treating the mesocolon exactly as the posterior peritoneum was treated in this technic. It is our belief that Duval's is the better method, although we have not as yet employed it.

The results following the medical forms of treatment will vary with the cooperation of the patient and with the type of obstruction present. Unless the patient is able to understand the reason for the strict regime and to apply the treatment as directed, the result will be desultory. Symptoms from obstruction at the duodenojejunal junction due to an abnormally short iliac mesentery are temporarily relieved from Trendelenburg posture after meals. But no form of pad or other external apparatus can be devised to effectively hold up the small intestine when the patient stands up. The erect posture will cause the iliac loops to sink as low as the mesentery permits, or until they rest against some support on the floor of the abdominal cavity. In these cases duodenojejunostomy is definitely indicated.

Successful treatment for this lesion in either of its forms is particularly gratifying because it concerns a class of patients who are the most difficult to understand and to treat. It deals with those miserable victims who go from physician to physician, and from hospital to hospital, year after year, with the pseudoscientific diagnosis of neurasthenia written all over them. We have proofs that many socalled chronic neurasthenics may be restored to mental and physical equilibrium by putting into practice the theory that coloptosis and duodenal obstruction are one grand cause of neurasthenia in the usual acceptance of this term.

We have made in all sixteen duodenojejunostomies for the disease in question, the first five of which were reported in 1920 (Quain). Five of the operations were made in conjunction with right colofixation. We have postoperative information from fourteen of the patients. There was no operative fatality. The lack of improvement in two patients may reasonably be ascribed to massive adhesions following previous multiple laparotomies. Two patients in whom a demonstrated and markedly ptosed colon was not fixed are still having epigastric and other symptoms. Three others report that they are much improved from their former digestive troubles but that they still have mild attacks of nausea and inability to eat large meals without causing some distress. All three have gained several pounds in weight. One patient had polycystic kidneys, discovered during the operation. Duodenojejunostomy was nevertheless done because of a marked prolapse and distention. The previous nausea, anorexia and periodical bile emesis were relieved by the operation but the patient is now suffering from the kidney lesion. Among the six who state that they are entirely cured from their symptoms are the three patients of the series who had the most pronounced evidence of obstruction at the duodenojejunal junction.

Total failure to give relief in twenty-eight and a half per cent. of the patients and failure to cure entirely an equal number may at first glance seem discouraging for the future reputation of this operation. But after a closer study of the situation one must admit that no other form of treatment known promises more than a fraction of the successful results here related. Nearly fifty per cent. of the patients who had been chronic invalids were taken entirely from the sick list, and others were improved sufficiently to resume their proper positions in the affairs of life. It is confidently believed that with the experience gained and with a fuller understanding of the causes which underlie chronic duodenal obstruction, its future treatment, both medical and surgical, will become more successful.

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A bibliography will appear in the author's reprints.

Experimental and Clinical Observations on the Simplification of the Intestinal Flora

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The intestinal tract at birth is free from bacteria for a short period of time. The bacteria find entrance through the mouth and the anus, and within two or three days the fecal contents are made up, in large part, of bacteria. Levin has demonstrated that in many instances the intestinal tract of arctic animals is free from bacteria. Other investigations have proven that it is possible for us to exist without intestinal bacteria.

The intestinal tract of man swarms with bacteria; billions are eliminated daily in the fecal excretions. Under normal conditions the bacteria existing in the digestive tube do not enter into the makeup of the human being. They do not invade the tissues or the circulation and may be said to exist in an area within the body, which at the same time might be considered an exterior surface of the body. Granting that these organisms have not invaded the host, what influences have they upon his well being?

For a long while it has been recognized that diet is capable of influencing the character of the intestinal flora. However, the matter has not been given serious consideration until recently. Rettger and Cheplin, in their recent book (7) have stated their results in connection with the transformation of the intestinal flora by definite dietary procedures. They have found that on a mixed diet the character of the intestinal flora is dominated to a greater or lesser degree by the putrefactive forms of bacteria which inhabit the intestinal tract. However, by the oral implantation of large quantities of Bacillus acidophilus or the administration of large doses of lactose, it is possible to simplify the intestinal flora within three to five days. In other words the aciduric forms predominate and seem to inhibit the putrefactive types, which live on protein residue. Therefore, the animal tissues supply the nitrogenous containing pabulum for their growth. On the other hand, the carbohydrates promote the growth of the fermentative or aciduric types.

It is a conceded fact that protein is a necessary physiological requirement. The average dietary of man, however, seems to be overloaded with protein and for this reason the putrefactive types predominate. By feeding a human a diet in which the protein is somewhat restricted, with the addition of lactose in sufficient quantities and with oral ingestion of Bacillus acidophilus, the intestinal flora becomes simplified. Therefore, their work would suggest that the aciduric forms of intestinal bacteria, such as

Bacillus bifidus, Bacillus acidophilus, and Bacillus lactis aerogenes, have been planned by Nature to inhibit the growth of the putrefactive forms.

Kendall, Rettger, Norman and others have proved that Bacillus bulgaricus cannot be acclimatized to the intestinal tract and that the bacteria that seemed to have been Bacillus bulgaricus in the stools have really been Bacillus acidophilus whose growth had been promoted by the lactose contained in the milk fed to the patient (one to eleven). With these facts at hand, it seems obvious that it is much more desirable to have bacteria that produce fermentation than to have bacteria which produce putrefaction. For a long time fermentation has been considered undesirable, but as a matter of fact the process that really existed was not fermentation but putrefaction. Fermentative types disintegrate the carbohydrates while the putrefactive types are responsible for protein breakdown. With the aciduric flora predominating the poisonous products of putrefaction are not formed and of course not assimilated, and in this wise the clinical syndrome falling under the head of autointoxication or intestinal toxemia is obviated. Rettger and Cheplin have found that lactose is the ideal sugar for the stimulation of an aciduric flora. Dextrin will also produce the same result but is not practical because of its objectionable taste. Lactose is palatable and easy to take. The other sugars apparently have no influence on the growth of the aciduric forms.

Rettger and Cheplin's work has been experimental on animals and apparently normal human beings. Their conclusions suggest that the simplification of the intestinal flora would be of benefit in certain forms of disease in which there is associated a predominance of the putrefactive forms of bacteria in the intestinal tract. The first clinical application of Bacillus acidophilus therapy was made by Coleman (12) and Torrey (13) on typhoid patients. They observed that typhoid cases ran a protracted course and displayed tendencies to the usual complications when the aciduric forms of bacteria were absent from the stools of these patients. On the other hand, when the aciduric forms were present in the stools of typhoid patients, the course of the disease was cut short and the tendency to complication reduced.

Norman (8 to 18) and Norman and Eggston (9 to 11) have given to this form of therapy a more widespread application and their observations and conclusions are in direct support of Rettger and Cheplin's and Coleman and Torrey's work. Their problem differed from Rettger and Cheplin's in that it has been a clinical application of this biological principle to humans suffering from some form of chronic disease. Obviously, the application of this principle to diseased digestive tracts necessitated more radical measures than its application to relatively healthy animals and humans. In this application to humans a few fundamental conclusions were reached very early, the most important being that it is impossible to simplify the intestinal flora and maintain a satisfactory simplification if there existed foci of infection in the upper digestive tract (teeth, tonsils, sinuses, respiratory tract, and gallbladder). In other words, unless the fountain head of the supply of infection was removed, it was found to be impossible to rid the intestinal tract of its pyogenic infection regardless of the amount of free drainage of the colon, the lactose laden diet, and the oral and rectal implantation of the protective types of bacteria. Therefore, they concluded that the clinical application of this biological principle presumes the elimination of primary foci in the upper digestive tract before a simplification of the flora of the lower digestive tract is attempted. They state that the putrefactive processes predispose the intestinal tract, in many instances, to pyogenic infection, and, in every instance where there is pyogenic infection of the lower digestive tract, there is associated a putrefactive type of intestinal toxemia.

They have reached the same conclusions of Rettger and Cheplin concerning the use of Bacillus bulgaricus. They state that the colon bacillus is reformed by the lactose laden diet and by association with the aciduric types, and for this reason, unless specially indicated by the absence of the colon bacillus from the stool of a freely drained colon, they do not implant colon bacilli as their experiences have led them to believe that it is rare to find the colon bacillus absent from the fecal contents of a freely drained colon. Their clinical results have been satisfactory and have been accomplished with a minimum use of drugs and no cathartics. They sum up their conclusions by stating that a deinfection of the intestinal tract depends upon five salient factors:

1. The removal or correction of foci of infection in the upper digestive and respiratory tract.
2. Nonsurgical mechanical drainage of the colon.
3. The oral and rectal implantation of protective forms of bacteria as indicated from cultures of the fecal contents of a drained colon.
4. A lactose laden diet.
5. Autogenous vaccines in selected cases.

They believe that by following this method the necessity for cholecystostomies, cholecystectomies, appendectomies and hemorrhoidectomies may, in many instances, be obviated. The conclusions of these investigators have opened up a new field for medical thought and therapeutic endeavor, and it is to be hoped that this work will be followed by other investigators. It is interesting to note the revival of interest in the intestinal tract as a prolific source of etiological factors in many diseases of obscure origin. These investigations are shedding much light on the relationship of a normal and pathological intestinal flora to health or disease.

My own experience with the Norman-Eggston method of treating infections of the digestive tract, as well as in treating those diseases which are caused by infections of the digestive tract or associated with infections of the digestive tract, was approached with a considerable degree of conservatism. However, as I have become more acquainted with their technic I have become more impressed with the logic of their deductions, and the results obtained have been highly satisfactory. I believe that the combination of the Meltzer-Lyon method with the Norman-Eggston method offers the most practical method not alone for the etiological diagnosis of gastroenteric conditions, but also for therapeutically combating these conditions along with well established biological measures (19).

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Editorial Articles

HOPE

The world is becoming a splendid place to live in. Some philosopher in the long ago in his search for truth, forgetting for the moment the cruelties of Nature, said, "The world is fine; man alone is bad." So we have come to see a day when even this banality may be refuted. Should this philosopher revisit our planet, say in a few years, he could well say, "The world is cruel; man alone is good." Some may scoff at this optimism and demand proof. Living for centuries in a repressed civilization, recently evolved from savagery and carrying over enough of its lusts to make them evident at every turning, it is little wonder that man has become habituated to an imperfect state of affairs and doubts vigorously the possibility of any change. So it becomes necessary to cite proofs. A rapid survey must suffice, for this is a medical journal and we must stress the medical point of view.

Recently a body of women met in a neighboring city and decreed that the nude in art must be abolished. This will do much to take us away from the barbaric. How many souls have been shattered by the vile Athenian statues! These too should be destroyed; otherwise they will continue in their silent mission of depravity. This idea should be applied to medicine. If it were only known how uncouth it was for one person to examine another physically merely to find out what disease a patient might have! What possible difference could this make? Diseases differ only in name and in a few insignificant symptoms. By all means let us return to the halcyon days when physical examinations were made under large white sheets. It may smack of guesswork, but what matter, when we are striving for purity?

Then we have with us a valiant crusader—one called Sumner. Truth to tell he has had some few setbacks in his quest for the perfect and in his attempted suppression of the virile in literature, but he is sure to win in the end, for virtue will triumph over vigor in any suppressed state. He too has made a most essential suggestion and it is only a question of time. . . . He feels that he and his committee should censor medical literature. Think of his volunteering for this heroic task! Truly the world is becoming better! He knows nothing about medicine—or literature for that matter—and this makes his attitude more courageous. He intimated that many things are published in medical journals today which should be deleted. He is right. He must read most of our exchanges. How can right and truth fail to prevail when we have people who see the light so clearly? Time alone prevents the consummation of this fight for purity. But medicine must receive her share of the credit for the betterment of man.

One of the foremost figures today is that grand old man, Coué. Simplicity dominates his creed. Once it was thought that Abrams and his machine would liberate medical men from the thraldom of their tasks. Some still hold that his way to emancipation would not be so drastic and would still allow for a chosen few to operate his wonder machine. Others favor Coué, for then, with one fell swoop, we could abolish medicine and all its cumbersome appliances and its most tiresome literature. Coué's formula? But why give it when for a single dollar his book may be bought and from its sale in this country no doubt you are all familiar with the words of the master. After all there is some sanity in all this. The responsibility is put squarely up to the patient. He can either get well or not just as he likes. If he is unfortunate enough to stutter and cannot manipulate the original French *ce passe, ce passe,* or if he is not nimble enough to repeat these words with the rapidity required, he can adopt a synonym, or some other language. The wonder of Coué's discovery is that it has not been put to use long before. The idea, no doubt, was suggested by the echolalia which is so frequent among the psychotic.

How little remains today of the medicine of yesteryear! The books of Galen, Hippocrates, Æsculapius are the property of the historian rather than of the medical man. And so it will be in a few short years with our records of achievement of today. A brighter day will come. There will be no more nude in art, nor in medicine. The ethics and literature of medicine—if medicine will by any crude play of chance survive—will be looked after, just as literature will be kept tidy by the successors of Sumner. Better yet, we can see the passing of all medicine, of all evil through the efforts of that French wizard Coué. The world awakens. All of the world's iniquities will vanish by the use of those magic words *ce passe, ce passe.*

PROFESSIONAL SECRECY

At the meeting of the British Medical Association this year one of the most controversial themes for discussion was that of professional secrecy; when a physician should divulge secrets which a patient had entrusted him with in order that he, the medical man, might be enabled to heal him or her to the best advantage. It is obvious that there are certain facts in a patient's history that must be revealed to a doctor if the patient is to be healed properly. Some of these revelations are of the most intimate nature and in the ordinary course of events are sacred. Sometimes, however, it occurs that in a court of law the knowledge of such secrets appears to the legal mind essential to the conduct of justice, or withholding them would be contrary to exact judicial procedure. In a dilemma of this kind, what is the medical witness to do? Is he to refuse to tell under the plea that the confidence is sacred and that it has generally been allowed, in a circumstance of this character, the doctor has a right to refuse and to demand that he be placed in the same category as the priest or minister and even the lawyer, who are not compelled to divulge secrets which have been told them under the seal of confession, in their role of ministers of the church or in their capacity as lawyers?

In Great Britain recently doctors have been threatened with punishment for contempt of court if they refused to tell professional secrets. At the meeting of the British Medical Association when this matter was discussed, it was found that a great deal of difference of opinion existed among members of the medical profession. Finally, it was resolved to compromise on the subject. But the profession, or the majority present at the discussion, gave way before the power of the law, or at any rate, receded from the former uncompromising stand taken that the doctor witness in no circumstances should tell. Quite recently the question has cropped up again. Lord Birkenhead, up to a few weeks ago Lord Chancellor of Great Britain, has published a book of essays. One of these deals with professional secrecy and regards it from an altogether different point of view from that of the medical profession. While agreeing with the broad proposition that the relations between a doctor and his patient should be confidential, he considers that the only question which arises is to the limits which should be set to this relation of confidence. Lord Birkenhead states it as his opinion and as the general legal apprehension of the question that the socalled privilege is conferred only for "the general advantage of the community upon the ground that, unless a relation of absolute confidence can be established between the lay client and his professional adviser in practice the end of justice cannot be obtained." Moreover, the "privilege" is denied to the client who consults a lawyer in the course of his employment which shows that crime or fraud has been committed since the commencement of his employment. The question as to the obligation of priests with reference to matters disclosed to them in the confessional appears to be a separate question. It would not perhaps be easy to find a reported case in which a priest has been compelled to disclose such communications, and more than one learned judge in Great Britain has expressed the strongest disinclination to compel such disclosure. Lord Birkenhead then regards the doctrine of medical secrecy in every circumstance as a retrograde movement and points out that the whole tendency of British law for many years has been in the direction of opening the mouths of those who can assist the course of justice, and not of closing them; in reducing those classes whose testimony, for whatever reason, cannot be accepted in a court of law rather than increasing them, and in this, as in other matters, breaking down barriers of privilege for each of which, before it fell, a sturdy argument might be adduced.

But, despite the subtle and ingenious arguments brought forward by the ex-Lord Chancellor of England, the medical profession is by no means convinced that all these arguments are sound. Of course, the medical man cannot argue so plausibly, and even speciously, as the lawyer who is trained to convince a jury ofttimes that black is white and who sometimes gets a nervous witness into such a tangle that he asserts that this is the case. It is allowed, probably by a majority of the profession, that a doctor should tell in a court of justice where, under the direction of a judge, proper questions are put to him which it is necessary for the doctor to answer in order that the ends of justice may not be defeated. However, the medical witness requires now and then to be protected from the lawyer who is not too scrupulous in his methods of trying to win a case and for the purpose would not hesitate to extract from the medical witness unessential information which had been told to him as a professional secret. If the laity know that a doctor may have to reveal anything told him in his professional capacity there will be few secrets disclosed; at best this would be a severe handicap to both patient and medical attendant, as information of this nature often provides a valuable clue to the best treatment; indeed, is sometimes necessary to effective treatment. Therefore, further discussion is needful and the lawyers must not be permitted to have it all their own way and ride roughshod over the medical profession. The matter affects this country as much as it does Great Britain and it would be interesting to learn opinions of medical men, lawyers and others here. The NEW YORK MEDICAL JOURNAL AND MEDICAL RECORD will welcome letters from its readers on this subject.

THE BILE TEST IN THE DIAGNOSIS AND TREATMENT OF AMEBIC DYSENTERY

Examination of the feces in long standing cases of chronic intestinal amebiasis only reveals encysted amebæ, and their great rarity in some instances is such that the examination may have to be repeated several times. Even then the result may be negative although the patient is really a carrier of the parasite. On account of the rarity of the parasite there ensues a real difficulty in diagnosis, while encysting of the organism causes real difficulty in treatment.

Le Noir and de Fossey have attempted to place amebiasis in evidence and to treat it in better conditions by momentarily creating a medium favorable to the development of the parasite by provoking an artificial, benign, acute phase—a reactivation—during which one may more easily make a microscopic diagnosis and obtain the maximum effect from treatment by acting upon new forms of the parasite. To attain this end these observers administered biliary extracts to their patients, either in the form of desiccated bile contained in keratinized capsules or some of the commercial preparations. Nine capsules each containing twenty centigrams of bile extract are given daily, three at each meal, and each day the dose is increased by one capsule at each meal. This increasing daily dose of three capsules is continued until a free evacuation of the bowels ensues. During this treatment the patient continues his ordinary diet.

By this medication, after a lapse of time varying according to the subject, liquid stools appear in which living amebæ are found, as well as numerous cysts. If at this time an energetic treatment is resorted to, the younger, hence the more vulnerable, types of parasites are attacked. Le Noir and de Fossey have carried out this test in numerous cases which they classify in three series as follows: In the first series emetine hydrochloride was exhibited in a single dose of eight centigrams on the first day, eight centigrams in two doses on the second day, and then four centigrams daily for four days. Eleven subjects were thus treated, nine being discharged much improved, and two less so. In six of these patients a new bile test, made before the patient was discharged, showed that the feces were free from amebæ; in two others the parasite was still detected and a second treatment resulted in a complete success.

The second series comprised nine cases treated with Ravant's novarsenobenzol method, ipecac paste and bismuth. A rapid improvement ensued. The third series of patients were treated with the double iodide of emetine and bismuth. The drug was badly tolerated and was changed to the treatment used in the second series, which resulted in a cure. Ravant's method, combined with rectal injections of mucilage, bismuth and arsenobenzol (Taillandier's method) also resulted favorably. It is evident that the bile test is of interest from the triple point of view of the diagnosis, treatment and prognosis of amebiasis.

THE EFFECTS OF ALCOHOL ON GASTRIC DIGESTION

Much has been written in respect to the effects of alcohol on gastric digestion and it would seem that in the present state of our knowledge many observers have gone too far by eliminating alcohol and alcoholic drinks in all patients complaining of gastric disturbances of no matter what nature. It is undeniable that alcohol may render great service in certain affections of the stomach. In healthy individuals a small dose of alcohol—fifteen cubic centimetres of brandy—taken at meals increases the quantity of gastric juice, likewise its tenor in hydrochloric acid and its digestive capacity. A larger dose—fifty cubic centimetres of brandy—given after meals always increases the gastric secretion, while digestion is in no way interfered with. If the same dose be given before a meal it affects the digestion unfavorably.

The effect of alcohol is not due to a direct action on the gastric mucosa, because a certain time is necessary for it to be produced. It is probable that alcohol—which is very rapidly absorbed by the gastric mucosa—acts on the central nervous system, and by its intermediary, on the secretory nervous system of the stomach.

Considering the action of alcohol in various pathological states of the stomach it can be said with a fair degree of certainty that in hyperacid dyspepsia and ulcer, alcohol increases both the tenor in hydrochloric acid and the total acidity. Hence it increases the pyrosis and pain in these subjects and is therefore to be proscribed.

In gastric cancer alcohol has no action on the gastric secretion, but it frequently alleviates the pain, controls nausea and the sensation of plenitude of which these patients complain. In nervous dyspepsia the use of alcohol is favorable in elderly subjects with hypochlorhydria and hypoacidity, on the condition that it be taken with meals. It must be prudently exhibited in women and young people. The use of alcohol is to be recommended in achylia and chronic gastritis on account of its activating action on the digestion, and in several instances it has been known to cause the hydrochloric acid to reappear in the gastric juice from which it had previously been absent.

In elderly people there is frequently a marked decrease of free hydrochloric acid and if they present digestive disturbances due to a secretory and motor insufficiency, the moderate use of alcohol may be most effective in relieving the condition. As to alcoholic drinks—beer and wine—their action is the same as that of alcohol but more complex, because other factors—extractive matter—intervene. Beyond a certain concentration alcohol completely arrests gastric digestion from precipitation of pepsin. Hence, the limit of alcohol in the gastric contents must never exceed ten in one hundred.

THE ALARM CLOCK INTESTINE

By this very apt term Baumann and Matignon describe a rather frequent symptom occurring in subjects suffering from intestinal disturbances. These patients complain of being awakened in the night or early morning at a regular hour by pains seated in the right flank, of varying intensity and duration, sometimes subsiding after expulsion or simple displacement of gas, and followed or not by a doughy or frankly diarrheic stool.

This morbid phenomenon is encountered in the most varied types of colonopathy, but in practically the same circumstances, such as chronic appendicitis, the colitides, ptoses and long standing dysenteries. It indicates a normal state of the cecum and ascending colon, but with a heightened sensibility and abnormal distention of the bowel, the result of an accumulation of gas which is hindered in its circulation by some organic or functional obstacle. The original obstacle is usually a bend or kink in the bowel, due to a ptosis, or otherwise, bands or adhesions, or Jackson's membrane, all being the remains of a former pericolitis with a peritoneal reaction. The functional obstacle is represented solely by intestinal spasm.

When this symptom is present it is naturally of first importance to examine thoroughly the intestinal tract by serial radioscopy which is the only means at our disposal for obtaining the necessary data relating to the nature and situation of the obstacle. Hence it is the only procedure that will indicate the proper treatment to be pursued. If spasm alone is the cause, diet, thermotherapy and hydrotherapy will usually cause the spasm to subside and excellent results may be anticipated. In cases where examination reveals bends, kinks, ptosis, etc., the condition will require surgical treatment.

INTESTINAL STASIS AND SOME OF ITS EFFECTS

Chronic intestinal stasis is now recognized as being the cause of many diseases and states of continued ill health. The reason is not far to seek. The retention of intestinal contents for an extended length of time results in fermentation and putrefaction of the retained material and frequently brings about the poisoning of the entire system, obviously with effects prejudicial to the health of the individual concerned. As to the outcome of prolonged intestinal stasis, opinions vary. While some are wont to attribute to it most of the ills to which human flesh is heir, others hold that its bad results are exaggerated.

In Great Britain, however, it seems that views are veering towards the belief that chronic intestinal stasis ending in alimentary toxemia is responsible for a very large number of diseases and complaints. A well known Scotch alienist, Dr. Robertson, has mooted recently the suggestion that dementia præcox has its origin in the toxemia of chronic intestinal stasis. His experience and investigations in this direction appear to favor if not actually to clinch this point of view. In an article which appeared in the *Lancet,* May 29, 1915, Mr. Percy Dunn pointed out that certain diseases of the eye exhibited to him unmistakable signs that they were due to thyroid insufficiency brought about by metabolic toxemia. It may be mentioned that this article has been favorably received by ophthalmologists in this country and made the subject of much discussion. In a later article he has gone further and states more specifically that he has come to the conclusion there is a more or less close relationship between intestinal toxemia, the result of intestinal stasis, and ocular disease. All who have made a study of the subject are agreed that preventive treatment of intestinal stasis is the most effective prevention and it now seems that possible means of prevention have been found.

COUNTY ORGANIZATION FOR CHILD WELFARE

The Children's Bureau of the United States Department of Labor has recently issued a report entitled *County Organization for Child Care and Protection,* which describes the latest administrative advances in the local care of dependent, defective and delinquent children. Local boards of citizens employing trained workers and aided by State boards form the administrative units of this plan, which is being found most practicable in an increasing number of States. Arkansas, Minnesota, Missouri, North Carolina and Virginia have, within recent years, passed laws requiring or permitting county welfare work of broad scope. Individual counties, private agencies or State boards in Alabama, California, Florida, New Jersey, Pennsylvania and South Carolina are making similar plans without special legislation. Arizona, Indiana, New York and Ohio have county organizations for the care of dependent children. For the States where this county organization is especially well developed, namely, New York, New Jersey, Minnesota, North Carolina and California accounts of the methods used have been contributed to the report by the persons most directly concerned in the working out of the plans described. Summaries of the work in the other States are also given in the report.

In the past, according to the report, the development of preventive and constructive activities for children in rural districts usually depended on the willingness of some private individual or group to assume the financial obligation, but today county commissioners in many States are finding it sound economy to make an appropriation for this purpose. The recent rapid growth of county welfare work has come about largely as a result of the development of state wide plans, but local organization is usually put into effect only after the county has indicated a desire for it. The report quotes the secretary of the California State Board of Charities as saying, "There can be no welfare department unless the supervisors are ready to have it"; while the director of the Children's Bureau of Minnesota states that it has not been necessary to arouse the local communities to an interest in the matter because they have been making requests more rapidly than the State department could meet the demand. Of the eighty-six counties of Minnesota sixty-nine have child welfare boards.

In order to help cope with the difficulty of securing executives and superintendents trained for the work, the State universities are giving courses to prepare students to return to their home communities and take up this work as a career. State boards are making possible the interchange of experience and ideas through conferences, publications and other means. In the country the welfare worker has to be a general practitioner, but he is required to have a knowledge of the standard practices in the various fields of child welfare work, and the understanding and commonsense to be able to adapt these methods to the requirements of rural conditions.

In sparsely populated counties and those possessing agencies whose work already covers part of the field, the care and protection of children may be combined with public health nursing, the enforcement of school attendance, preventive and reconstructive work in families, including poor relief and supervision of persons on probation or parole. In others the task is extensive enough to warrant dealing separately with each of these groups of activities, but the general tendency is in the direction of broad, coordinated programs. The movement toward unified county organization of welfare work is frequently, as the report states, the results of "local effort to combine modern principles of social work with business methods." This eliminates duplication of effort and fosters the discovery of and provision for new or neglected fields of endeavor.

MIND AND BODY

The relation of mind and body is ever one of the most interesting of problems. Professor Sherrington, in his illuminating presidential address before the British Association, has presented the subject anew from the viewpoint of 1922 scientific thought.

It is significant that Professor Sherrington asks: "The dog, our household friend—do we exhaust its aspects if, in assessing its sum total, we omit its mind? A mere reflex pet would give little pleasure even to the fondest of us." A quarter of a century ago the use of the word mind in connection with that of dog would have been made with some explanation, forty years ago with considerable apology, and at a more distant date it would hardly have been made at all unless in private.

Though speaking of the mind as no mere reflex mechanism Sherrington goes on to point out that the evolution of mental activity has gone forward hand in hand with the development of the nervous system. "Mind does not seem to attach to life, however complex, where there is no nervous system, nor even where the system, though present, is little developed. Mind becomes more recognizable the more the nerve system is developed; hence the difficulty of the twilight emergence of mind from no mind, which is repeated even in the individual life history. . . . To pass from a nerve impulse to a psychical event, a sense impression, percept, or emotion is, as it were, a step from one world to another an incommensurable one. We might expect, then, that at the place of transition from its nonmental to its mental regions the brain would exhibit some striking change of structure. But it is not so; in the mental parts of the brain there is nothing but the same old structural elements, set end to end, suggestion the one function of transmission and collision of nerve impulses. The structural interconnections are richer, but that is merely a quantitive change."

The results of disease or injury of the more recently developed portions of the nervous system upon the mind; the effect of low oxygen pressure or of an anesthetic upon mental working, emphasize the connection between the physical and psychical phenomena. The "nexus between the two sets of events is strict, but for comprehension of the nature of the connection we still require, it seems, comprehension of the unsolved mystery of the 'how' of life itself. A shadowy bridge between them may lie perhaps in the reflection that for the observer himself the physical phenomena he observes are, in the last resort, psychical."

It was a long step forward (a long step down, some would have us think) that of acknowledging a dog or other animal to be the possessor of mind —the same sort of mind that we illustrious humans have been wont to think to be possessed by us only. The next and even longer step which we seem just beginning to take is toward acknowledging the wonder and mystery of matter, and that mind is but an attribute of matter exhibiting itself in various ways as matter arranges itself in the course of evolution into an infinity of more and more complex forms. We approach no nearer the mystery by such a conception, but the mystery becomes more wonderful with our broadening view of it, even if man's egotism receives coincidently a considerable dampening.

PSYCHOTHERAPY IN FRANCE.

There has been a slow invasion of psychoanalysis in France recently. Freud's *General Introduction to Psychoanalysis* has been translated into French; Raymond de Saussure's excellent monograph, *La Méthode Psychanalytique,* with a preface by Freud, has appeared as the first authoritative book written in French on psychoanalysis, and numerous articles have appeared discussing psychoanalytical methods and theories, most of them in nonmedical publications.

In a special mental and medicolegal number of *Paris medical,* October 21, 1921, there appears an extremely tolerant and well written article by Schitlowski on General Considerations of Psychoanalysis. He sums up the reasons, or at least some of the reasons, why psychoanalysis has been so slow in getting a foothold in France. He forecasts the day when it will be as popular in France as it has become in other European countries and in England and America. His article, while not covering completely the field, is well worth reading. He shows that psychoanalysis is an exact science, with certain marked and admitted limitations, and has a wide field of usefulness both as a diagnostic and a therapeutic agent.

THE ECONOMY OF ANIMAL RESEARCH.

At a recent meeting of the State Federation of Pennsylvania Women a resolution was passed to record the gratitude of the convention to medical science "for past discoveries so profoundly beneficial to human beings and to animals" and to endorse the continuation and encouragement of such beneficent researches made through scientific experiments on animals. Dr. W. W. Keen, emeritus professor of surgery of Jefferson Medical College, Philadelphia, commends this resolution in a recent letter to the *New York Times,* and in so doing gives some interesting statistics on the economic results of animal research.

In 1915, according to Dr. Keen, the annual loss from hog cholera amounted to seventy-five million dollars. By sacrificing the lives of seventeen hogs, the Bureau of Animal Industry discovered a serum against hog cholera, with the result that in 1921 the annual loss was cut down to about twenty-eight million dollars. It is estimated that this represents the value of approximately four million seven hundred thousand hogs, and these were spared sickness and suffering as well as standing for an economic gain. The yearly food supply of the world was also increased by the saving of these hogs, many of which reproduced their kind.

In 1915 anthrax was costing in cattle and sheep about one million five hundred thousand dollars a year and was also causing human deaths from infection. Pasteur, by the sacrifice of several sheep, saved the entire cattle and sheep industry of France, a saving to the people of that country of more than the five billion francs exacted as reparation by Germany in 1871.

Among other results of animal experimentation are the efficacious use of ergot in checking postpartum hemorrhage and puerperal fever. Dr. Keen states that, at the time of his early practice, the death rate from maternal fever was five out of every one hundred mothers, and, in epidemics, fifty per cent. of the mothers. Pasteur's researches, having revealed the fact that the cause was the streptococcus carried on the hands and instruments of those attending the case, have made it possible to publish recently data showing 8,373 successive births without the death of even one mother from puerperal fever.

ANNALS OF MEDICAL HISTORY.

With the rush and push of modern medicine we are prone to overlook the work of the pioneers in medicine. The excellence of the presentation by the *Annals of Medical History* of historical medical characters and medical history is worthy of special commendation. No pains have been spared by Paul B. Hoeber, the publisher, and Dr. Francis R. Packard, the editor, in bringing together material of a very high character and producing a work of great worth, artistic merit, and stimulating in the extreme. Aside from the satisfaction a physician may gain from the knowledge of the work of his predecessors, there is also the value of an acquaintance with the evolution of the processes and thought of this highly intricate profession. The high standards set by the *Annals* at the time of its origin have been maintained and American physicians may well be proud of the results attained in the publication of this splendid periodical.

THE INDEX CATALOGUE.

Volume III of the Third Series (blood-coffart) of the Index Catalogue of the Library of the Surgeon General's Office, has been published. The compilation of this Index Catalogue is of the greatest value to the medical profession. Great care has been taken in the preparation of this material. Writers on medical topics, editors, and research workers find these volumes practically invaluable.

MEDICAL RELIEF WORK IN RUSSIA.

By Captain Paxton Hibben, F. R. G. S.,
New York.

The aftermath of the Russian famine of 1921-1922 is, in its way, as appalling a prospect as was the famine itself. I was in Russia last year and again this summer, and it is difficult to say which was the more depressing: the actual suffering from hunger, undernourishment, epidemics, and exposure attendant upon the food shortage resulting from last year's drought, or the lowered morale, inanition and general despair which characterizes some twenty-eight million of the Russian peasant population today, when it is plain that no immediate return to normal food conditions is now possible. The hope that a famine as far reaching in its effects as that through which Russia is still passing could be liquidated in one or even several years, is slowly being abandoned by the Russians. They are beginning to understand that it may well be many years before the country can recover, and a menacingly large proportion of the population is so dispirited at this realization that the work of stimulating their moral fibre becomes as important as looking after their physical welfare.

This is an element in the Russian situation of which the various foreign relief agencies„ which undertook temporary famine relief in Russia, left out of consideration. Their work was solely emergency work. They possessed neither the force nor the equipment for upbuilding those left ill, exhausted or suffering from inanition as a result of famine conditions. This task would naturally fall to a permanent Russian establishment, organized to continue relief work so long as there might be need for it. The establishment plainly indicated for this purpose was, of course, the Russian Red Cross.

It is the work of the Russian Red Cross in the famine country which is of greatest interest in Russia today, since on the Russian Red Cross depends in large measure the physical and moral regeneration of those who have survived war, famine and disease during the past eight years.

Fig. 1.—Receiving station of Russian Red Cross Hospital maintained by the California famine relief contributors.

It is with the moral as well as the physical regeneration of the peasants in view that the Russian Red Cross had made the rule that no ablebodied adult receives relief without performing some service of value to the community in return therefor. The street cleaning and general sanitation of the larger towns in the stricken area are all done by refugees and others who receive food relief from the Russian Red Cross. Road mending, bridge repairing, drainage, irrigation, and field work on farms are conducted under the direction of the Red Cross for the general good, by destitute peasants. Even flour mills have been built or repaired for common use by Red Cross workers.

Fig. 2.—Sanatorium and rest hospital maintained by the Russian Red Cross for professional men and women at Samara.

In medical work the field of the Russian Red Cross has grown with tremendous rapidity as the immediate hunger crisis diminished and the necessity for rehabilitation increased. The following table of work in its stations in the province of Samara, on the Volga, is illustrative of the added responsibility falling upon the Russian Red Cross:

	Ambulatory treatment		*Home treatment*		*Dressings*	*Operations*	*Obstetrical Cases*	*Deaths*	
	Once	*Several times*	*Once*	*Several times*				*Disease*	*Hunger*
Jan. ...	2,689	211	52	34	292	7	5	436	603
Feb. ...	3,025	1,418	105	81	368	5	3	488	234
March ..	4,499	1,854	602	231	457	21	2	2,925	3,129
April ..	6,237	2,712	878	491	1,044	77	13	2,003	2,156
May ...	11,107	4,047	1,402	877	1,551	119	25	1,241	1,332
June ...	17,453	8,247	1,932	1,277	3,047	197	31	950	476
Totals	45,010	18,489	4,971	2,991	6,759	426	79	8,034	7,930

In the treatment of diseases primarily due to famine conditions the following table for the same area gives the figures of the Russian Red Cross work:

	All stomach and bowel cases	*Bowel infections*	*Starvation cases*	*Intestinal typhus*	*Eruptive typhus*	*Recurrent typhus*
Jan.	3,447	186	214	70	442	285
Feb.	3,674	115	668	43	308	375
Mar.	6,137	169	776	36	276	301
Apr.	7,927	1,036	884	81	295	514
May	13,269	1,904	1,175	123	327	732
June	20,508	3,769	....	133	267	767
Totals	54,962	7,179	3,717	486	1,917	2,974

The medical equipment of the medical relief stations of the Russian Red Cross in the famine area is pathetically meagre, and the lack of medicines of the commonest sort is the deciding factor in limiting the number of patients that can be cared for. During August an epidemic of malaria ran through the whole Volga country, affecting not only those weakened by the famine of last winter but even as high as fifteen per cent. of the Russian army stationed in this area. The treatment adopted by Dr. Sophie Bugapolsky, in charge of this particular field, was subcutaneous injections of quinine; but the shortage of quinine soon halted preventive measures and left the Russian Red Cross gravely handicapped in coping with the emergency. Physicians working with the Russian Red Cross receive the equivalent of ten dollars a month for their services, which puts their work practically on a volunteer basis, while sixty-two and a half per cent. of the Red Cross field workers are volunteers.

It is in its work for the children, however, that the Russian Red Cross is especially effective. The child feeding supplies used are contributed almost entirely by the American Committee for Relief of Russian Children, whose headquarters are at 110 West Fortieth Street, New York, and which forwards, monthly, some twelve thousand dollars' worth of milk, oatmeal, sugar, chocolate, soap, and medicines exclusively for child care in the following Russian Red Cross stations in the famine region:

District	Number of Children
1. Kinel, Samara Co., Samara	4,386
2. Matveyevka, Bugurslan Co., Samara	4,723
3. Marino, Pugachev Co., Samara	7,903
4. Sorochinsk, Buzluk Co., Samara	2,648
5. Petrovsk	2,295
6. Oktyabirsk	4,800
7. Simbirsk-Syzran	534
8. Penza	249
9. Balakov	170
Total	27,708

Fig. 3.—Dr. Zenobius Soloviev, chairman of the Russian Red Cross Society.

The child feeding program of this committee for the approaching winter calls for the maintenance of eighty thousand children, to take over those left without support by the reduction of the relief work of other organizations. In all there are six hundred thousand "famine orphans" in the Volga and Ural country, and four hundred thousand in the Ukraine and the Crimea, to be taken care of by relief agencies.

Dr. Zenobius Soloviev is director of the Russian Red Cross work for the whole of Russia, and Dr. Oleg Adolfovitch Vistis, director of field work, and Dr. Sophie Jacobovna Bugapolsky, of Astrakhan, is in charge of the epidemic section. Dr. Soloviev, during the war, was medical director of the Association of Zemstvos, a semiofficial organization charged with peasant welfare, as well as sanitary inspector in the Russian Army. Previous to the war he was general secretary of the Imperial Antituberculosis Society. He became one of the best known of Russian physicians during a long period when he served as secretary of the Piragroff Society, a former Russian medical association. Dr. Soloviev faces his job with no support but the private contributions of people within and without Russia and such organizations as the American Committee for Relief of Russian Children as distribute their relief supplies through the Russian Red Cross. On account of the lack of medical equipment, hospital supplies, and even clothing with which his work is handicapped, he has made an appeal to American physicians to send, through the Russian Red Cross office at 110 West Fortieth Street, New York, or through the New York Medical Journal, old army medical kits, superfluous medicines and drugs of all kinds, and any hospital supplies that may be spared, for use in the medical relief stations of the Russian Red Cross.

In a recent letter Dr. Soloviev says: "The work is far from done—indeed, so far as the children are concerned, it is as yet only begun. There is still great danger of starvation in many districts; next winter is full of terror for the little ones who, barely nursed through the acute famine period, are not strong enough to withstand new trials. Unless the splendid work of the American Committee for Relief of Russian Children is continued through this coming winter at least, thousands upon thousands of these children will die before spring comes."

Just before I left Russia I received the following touching appeal from Dr. O. A. Vistis:

"Before you return to the United States I wish to take this opportunity of expressing to you and through you to the thousands of great hearted American men, women, and children the heartfelt gratitude of all of us who are working here on the 'hunger front' along the Volga for the wonderful support which the American Committee for Relief of Russian Children has given us, through the Russian Red Cross. You have seen our depots on whose shelves are what remains of the American products that you have sent us and you have yourself seen the little tots that we took half-starved from unheated houses seven months ago and brought to health and strength with the food that those who have contributed have brought with their money and sent half a world away to save the childhood of a whole race. You have visited our hospitals and seen not only the work of salvage that the Russian Red Cross is doing in them, but the need of them—need for sheets, blankets, warm clothing, medicines, dressings—everything.

"Will you not ask your countrymen just to see us through—just not to let the little ones whom they have saved so far, perish now for want of their continued help?"

Contrary to current opinion, much important work remains to be done. This brief review of some of the results gives an idea of the general situation. The good that has been done in the past should not be underestimated nor should the former efforts prevent us from completing the task begun. If far off countries suffer from disease and famine we will in turn pay a material price for "the chain is no stronger than its weakest link" and it is our duty to ourselves to strengthen these links wherever they may be.

110 West Fortieth Street.

Book Reviews

GASTRIC DISEASES.

Diseases of the Stomach and Upper Alimentary Tract. By Anthony Bassler, M.D., F.A.C.P., Professor of Gastroenterology, New York Polyclinic Medical School and Hospital. Fifth Edition. Revised and Enlarged. Illustrated with 151 Half Tone and Line Text Engravings and 93 Full Page Plates. Philadelphia: F. A. Davis Co., 1922.

Previous editions of this wellknown volume have been so favorably received that a fifth edition has been issued to meet the steady demand. The author has taken advantage of the opportunity to add considerable new material and to revise and rewrite some of the portions of the last edition, in which a change has seemed desirable. The last few years have seen numerous advances in our methods of diagnosis and therapy of pathological conditions of the alimentary tract and stomach, and the author has incorporated these advances, particularly in the matter of radiographic examination. The sections on the gastric juice, gastric motility and sensation have been enlarged and brought up to date. Likewise, the fractional test meal method of gastric analysis and the technical examination of gastric contents. Duodenal and rectal feeding are amplified and the gastric response to food is considered along new lines. There is a vast amount of information within the covers of this volume, which every general practitioner and specialist in gastric diseases can study with profit. The author and publisher have joined to produce a highly readable and useful volume, which constitutes a distinct addition to the American bibliography on this all important subject.

SYSTEMS OF MEDICINE.

Taylor's Practice of Medicine. By E. P. Poulton, M.A., M.D., Oxon., F.R.C.P., Lond. With the assistance of C. Putnam Symonds and H. W. Barber. Twelfth Edition. With 24 Plates and 87 Text Figures. Philadelphia: P. Blakiston's Son & Co., 1922. Pp. xiv-980.

Clinical Medicine I. By Lewellys F. Barker, M.D., LL.D., Professor of Medicine, Emeritus, Johns Hopkins University; Visiting Physician to Johns Hopkins Hospital, Baltimore. Illustrated. Philadelphia and London: W. B. Saunders Co., 1922. Pp. vii-617.

A System of Clinical Medicine. Dealing with the Diagnosis, Prognosis and Treatment of Disease. For Students and Practitioners. Illustrated. By Thomas Dixon Savill, M.D., Lond. Sixth Edition. New York: William Wood and Company, 1922. Pp. xxviii-951.

Hughes' Practice of Medicine. Including a Section on Mental Diseases and One on Diseases of the Skin. Twelfth Edition. By R. J. E. Scott, M.A., B.C.L., M.D. With 63 Illustrations. Philadelphia: P. Blakiston's Son & Co., 1922. Pp. xxlv-810.

Taylor's is one of the best grounded practices of medicine published. The material is progressive, and gives due regard to the integrative functions of man. Common sense and a due regard for the most modern in medicine permeate the entire work. A host of new material has been added and a great deal of the former text has been rewritten. The book may be commended heartily to the medical profession.

* * *

Anything that Barker writes is worthy of reading and study. We are especially fortunate in having access to this volume of *Tuesday Clinics* from the Johns Hopkins Hospital. We find portrayed representative cases ranging from carcinoma to the psychoneuroses. The exemplary cases of the infections and the respiratory, circulatory, digestive, and blood making systems, are worked out with care, the discussions are given and finally a résumé and survey of the literature. The same plan is followed for the urogenital system, the framework of the body, the metabolic disturbances, and the glands of internal secretion. Most noteworthy is the section devoted to the exposition of the diseases of the nervous system. From this section more psychiatry can be learned than from most textbooks on medicine. In all, the book has no dull spots. Stimulation for better work is in every line. We should be grateful for books of this character and demand more along similar lines. The publishers have done a great deal to add to the attractiveness of this volume.

* * *

Savill has compiled a conservative system of medicine, now in its fourth edition. One of the great drawbacks of this book is that it divides the patient into categories. In certain sections the book is not modern; in others, it is all that could be desired. Its weakest portions are those dealing with functional disorders, while the organic receive full value. This is a failing which is common to the majority of books of this class.

* * *

Hughes' is a convenient reference book on general medicine. In parts the book is fairly progressive, and in other sections archaic. The chapters dealing with mental diseases are obsolete, but from the therapeutic angle, the major portion of the book is reliable.

BIOCHEMISTRY.

Physiology and Biochemistry in Modern Medicine. By J. J. R. MacLeod, M.B., Professor of Physiology in the University of Toronto, Canada. Assisted by Roy G. Pierce, A. C. Redfield and N. B. Taylor, and others. Fourth Edition. With 243 Illustrations, Including Nine Plates in Colors. St. Louis: C. V. Mosby Company, 1922. Pp. xxxii-992.

A certain amount of progress in the field of the physiology and biochemistry of modern medicine has caused a new edition of this book to be brought out. This is one of the most valuable books of its kind in this country and the material always stresses the biological functions of the human economy. Of considerable importance are the revised chapters on the circulatory system and the chapter on pancreatic diabetes.

PHYSICAL DIAGNOSIS.

Physical Diagnosis. By W. D. Rose, M.D., Third Edition. With 319 Illustrations. St. Louis: C. V. Mosby Company, 1922. Pp. 755.

To those who are acquainted with the former editions of this textbook no introduction is required. There is a wealth of highly suggestive and most useful material presented. Every known means to medical science has received adequate treatment. The scope of the book is wide and the material has been well handled.

PRACTICAL ANATOMY.

A Manual of Practical Anatomy. A Guide to the Dissection of the Human Body. By THOMAS WALMSLEY, Professor of Anatomy in the Queen's University of Belfast. With a Preface by THOMAS H. BRYCE, M.A., M.D., Professor of Anatomy in the University of Glasgow. In Three Parts. Part I: The Upper and Lower Limbs. Part II: The Thorax and Abdomen. New York, Bombay, Calcutta and Madras: Longmans, Green and Co. 1921.

A most convenient "dissector" in three parts. The plan which has been followed, that of a "road map" enabling the student to find his way from place to place and then guiding him about the new districts visited, is an excellent one. It is practical and has a psychological value. No attempt has been made to supplant the regular textbook which is used as a manual away from the cadaver. The drawings are schematic, not showy but complete, as they should be, and will serve far better than more elaborate ones which may be confusing. The procedure outlined in these volumes has been followed with good success at Glasgow and no doubt will find favor in many institutions of learning.

DENTAL ANATOMY AND PHYSIOLOGY.

Aids to Dental Anatomy and Physiology. By ARTHUR S. UNDERWOOD, M.R.C.S., L.D.S. Fourth Edition. Revised by BAYFORD UNDERWOOD M.B., B.S., L.R.C.P., M.R.C.S., L.D.S., Dental Surgeon and Lecturer in Dental Anatomy. University College Hospital, Dental Department; Examiner in Dentistry, University of Bristol. New York: William Wood and Co., 1922. Pp. vi-170.

It is difficult to understand just what the author had in mind in writing this book, which he calls *Aids to Dental Anatomy and Physiology.* With a chapter on Comparative Dental Anatomy, another on Dental Histology, a third on Practical Microscopy, and a fourth on Human Dental Anatomy, it might be regarded as a platter of sundry information on general topics. The author seems to have made a rather good compilation of the work done in the histological and physiological departments in the consideration of the tooth and its component structures, but is sadly lacking in information regarding the descriptive anatomy of the human tooth.

Evidently Mr. Underwood has never heard of Dr. G. V. Black, the American, whose acute observations, combined with a clarity of expression, have made his textbook on dental anatomy a standard of information for the past quarter of a century. Generally Mr. Underwood's method of expression is literary rather than scientific. One cannot appreciate the necessity of resorting to a most elaborate metaphor of locomotives and trains and vanguards, with passengers alighting all over the mouth, to define such terms as mesial, distal, and lateral.

CRIMINOLOGY.

Crime. Its Cause and Treatment. By CLARENCE DARROW. New York: Thomas Y. Crowell Co., 1922. Pp. x-292.

A sympathetic yet not a sentimental study of criminology. To Darrow the criminal is a human being always, one who has chosen or has been forced into channels of adventure and crime. Darrow considers social, environmental and other conditioning factors, and in many instances society stands indicted. The fallacies and shortcomings of the law, the grim machinery, are revealed. Few men are better qualified to undertake a work of this character than Darrow. All of the book is intensely interesting and many ideas are presented which bring a new point of view to the man outside the workings of crime and punishment. Darrow has not gone into the factors dealing with the psychology of the criminal from the point of view of modern dynamic psychopathology, as these are somewhat outside his line. He indicates that the conditions exist, yet as a matter of fact, they are so vital that they should receive further elucidation and a book of this character should have a portion devoted to this topic. Perhaps it will be included in a later edition. The book as it stands is the best that has appeared on the subject.

INSECT BEHAVIOR.

Insect Behavior. By PAUL GRISWOLD HOWES. With Illustrations from Photographs by the Author. Boston: Richard G. Badger, 1921. Pp. 176.

A most painstaking observer with a most open mind guided by an excellent photographic technic and entomological knowledge is the author of this fascinating book on insect behavior. The insect is treated as an entity, his organs of special senses as well as his behavior as a complete organism are considered. The photographs, taken by the author in his original observations, are worthy of most favorable comment. The book will serve to add to our small knowledge of that vast world of insects and stimulate many of us to further work along this fertile field of endeavor. The book is a distinct and worthy contribution.

EMBRYOLOGY.

Human Embryology and Morphology. By ARTHUR KEITH, M.D., F.R.S., LL.D. (Aberdeen), F.R.C.S. (Eng.), Conservator of the Museum and Hunterian Professor. Royal College of Surgeons, England; Fullerian Professor in Comparative Anatomy, Royal Institution, London. Fourth Edition, Revised and Enlarged with Nearly Five Hundred Illustrations. New York: Longmans, Green & Co.; London: Edward Arnold, 1921. Pp. viii-491.

Many new findings in the field of embryology and morphology have made it necessary for Keith to rewrite almost completely this excellent textbook. The approximate age of embryos has been found to be about a week out of reckoning by Mall. Many new evolutionary factors in comparative anatomy have been uncovered making for change and revision. More light has been cast on the development and relative morphology of special organs and systems through careful study. All these factors have been considered in the revision of the book, and it is gratifying to note how carefully and adequately Professor Keith has incorporated the new material in this the latest edition of his scholarly work. About eighty illustrations have been added, bringing the total up to over five hundred.

MODERN PSYCHOLOGY IN THE NOVEL.

Babel. By JOHN COURNOS. New York: Boni & Liveright 1922. Pp. 431.

A vital book is *Babel.* Of primary interest to the psychologist is the selfrevelation of a young Jew burdened with a triple handicap of racial, individual and circumstantial inferiorities. From his angle we are shown the world, which to him is not the same, yet in many instances his picture is nearer the truth.

Driven into himself, struggling with his own inadequacies, he finds with accuracy the weak spots of our evolved civilization; so we find shortcomings of character, the *demivierge,* the false friend, the prostitute from choice, the businessman-philosopher, the philosophical businessman, the sadist, the fool.

In his quest for decency and growth, a decency somewhat moulded by his ancestral past and the growth affected by the commercial present, the boy from the Russian woods meets a material world ingrown from its rapid overgrowth and bent on destruction. . . .

The period covered by this book is the one that opens the gates of maturity for the Jewish boy whose family has emigrated from Russia to America to regain their foothold. Finally, the boy's craving for selfexpression, which he seeks in literature, causes him to cut adrift from family and go to London, the source of good English literature. His struggles with people, himself, his surroundings, and, finally, with a female who is caught in a conflict of her own between her craving for sexual expression and security, as expressed by one well able to care for her, make the reader follow these combats with a keen interest.

John Gombarov, the hero, is not so immersed in his own selfpity that he is unable to struggle for a creative goal, or to fail to make keen observations on life, philosophy, art, economics, religion and literature. These observations are brilliant and well grounded. Attention is given to unconscious processes, as by the interpolation of Gombarov's dreams and some of his fancies. Yet reality never flees from fantasy. Each is measured with a surprising surety. Beauty and poetic expression intermingle with harsh reality yet each falls into its proper niche at the proper moment. Here the artistry of the writer is revealed.

In many ways Cournos resembles the best of the Russian writers as somewhat tempered by western civilization. With skill he animates and individualizes the cities of London, Paris, New York and Philadelphia. Here alone he makes the error of treating his palette with his own affective reactions. The thing is more than well done and holds more than an element of truth, so this fault in reasoning from the particular to the general and back again to the particular we shall be obliged to overlook, for Cournos has no monopoly of this fault. We all have it in a measure. One of the reiterated notes in the book is the internationalization of art, of commerce, of education, of thought, of action. This is brought up from time to time and its influence on civilization is emphasized. There will be no war . . . and then, in spite of all and the conclusions entailed in some of the discussions, the close of the book brings us to a period just prior to the World War.

Cournos leads us to believe that more will follow regarding the life and struggles of Gombarov. No doubt these will prove as interesting as *Babel.* The earlier works of Cournos, *The Mask* and *The Wall,* give the boyhood and youth of John Gombarov, and are also extremely well written. They tend to complete the background of Gombarov, whose life history as revealed by Cournos is one of the most interesting and searching that has ever been written. Mr. Liveright, of Boni & Liveright, announces that he has taken over the publication of these earlier books. Students of human behavior should learn more from this series of books, of which *Babel* is the most important, than from most of the textbooks on the subject.

The younger writers of fiction are bringing us much fine psychological material—Cournos, Sinclair Lewis, James Joyce, Ben Hecht, and Waldo Frank. They have virility and a consciousness of what they are about. To this list may be added the women writers, May Sinclair in some of her more recent novels, Elsa Barker, whose *Fielding Sargent,* a review of which is published in this issue, is an amazingly clever introduction to psychoanalysis in novel form, and Cecil Tornay, of Hungary.

PSYCHOANALYSIS IN FICTION.

Fielding Sargent. A Novel. By Elsa Barker. New York: E. P. Dutton & Co., 1922. Pp. 319.

An amazingly clever task has been accomplished by Elsa Barker. She has taken psychoanalysis and woven it into a book of fiction so adroitly as to produce an excellent and almost faultless introduction to the study of psychoanalysis. She has done better than most of the writers of psychoanalytical primers for the socalled lay public, and with all this she has maintained a high literary standard and never forsaken her theme for the sake of driving home psychological facts. For a "planned book," meaning the converse of an "inspired" one, it holds attention from beginning to end. The various minor yet highly important technical details of analytical procedure are given in meticulous detail. She has gone to authentic sources and obtained her information accurately and presented it in a readable form. The book may be read profitably by medical men and safely by the lay public. She has produced a most worthy creation and is deserving of high praise.

A GOOD STORY.

The Breaking Point. By Mary Roberts Rinehart. Frontispiece by Thomas Fogarty. New York: George H. Doran Co., 1922. Pp. 356.

In *The Breaking Point* Mrs. Rhinehart has written an exceptionally good mystery story. The interplay of circumstances is out of the ordinary, the dénouement thrilling to the last degree. The adventures of an amnesia victim—let the physician try to unravel this puzzle taken from his own domain. It will provide him real satisfaction.

RUSSIA.

Mother. By Maxim Gorky. Foreword by Charles Edward Russell. With Eight Illustrations by Sigmund De Ivanowski. New York: D. Appleton and Company, 1921. Pp. xvi-499.

This translation of Gorky's famous novel of the awakening of the proletariat comes at a time when an understanding of the thought currents of present day Russia is necessary. In it, the mother, symbolic representation of all that is superstitious, traditional, unprogressive in the peasant mind, confronted by the horror of her son's illegal political interests, is nevertheless won over to the justice of the Socialist program by the actual conditions of the life which she and so many other sufferers lead. The conditions as described in the book are only too true, both in the Russia that was and the America that is. If this realistic drama will but serve to open people's eyes to fact, send them out to seek for themselves, a step in the direction of universal brotherhood in the truest human sense will have been made. Woven into the story is the theme of mother love that makes the book still more real.

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Medicoliterary Notes.

H. G. Wells, that most prolific of modern writers, has the first instalment of a new novel in the November issue of *Hearst's International Magazine.* The title, Men Like Gods, suggests the theme and time of the story, two thousand years in the future. The book promises to be somewhat in the nature of prophecy of conditions at that time, based on the author's knowledge of the most advanced present day theories in science and ethics.

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Approximately one third of the population of Moscow subsist, according to a recent bulletin of the American Relief Administration, on the Government ration, supplemented by such purchases as are permitted by their very meagre incomes. The various Government employees have been classified into categories according to the character of their work. Highly skilled workmen and officials receive regularly the largest ration. The "academic ration" is issued to physicians occupying responsible positions, to professors and to scientific men, and those eligible for this are given in addition a half ration for each member of their families unable to work.

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In *Scribner's Magazine* for November, Mary Brierly has a social and psychological study entitled The Man, the Woman and the University. The writer discusses the change in the relationships of men and women resulting from the reactions of higher education. In the same number of the magazine Oliver La Farge writes on The Human Boy and the Microscope, a study of the emotions.

* * *

Those who heard Hugh Walpole on his lecture tour through this country will be interested to read his autobiography appearing in the *Bookman.* The second instalment in the November number of this magazine is particularly interesting. It is published under the subtitle, "Cathedral Piece," and is the study of the effect upon the mind of a boy of the atmosphere of a cathedral town with its theological bias. In the same number of the *Bookman* Grace Hazard Conkling has an article on "Children and Poetry," chiefly a plea for the realization that most children have a real appreciation of the beautiful and the artistic, which is only awaiting expression.

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Among other announcements for the coming year, the *Atlantic Monthly* makes the following: Katharine Fullerton Gerould will write on the problem of divorce; Joseph Fishman, for many years Federal Inspector of Prisons, will discuss prison conditions and reform; natural history studies will be contributed by the well known traveler scientist, William Beebe, by Hans Coudenhove, who lived for many years in a tent in Central Africa, and by Ruth Rose, a lover of jungle life; and Ernest E. Calkins will contribute matter of practical interest to the deaf.

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Probably the most interesting and only valuable portion of Sir Harry Johnston's novel, *The Veneerings,* a long drawn out and not very interesting nor consistent sequel to Charles Dickens's *Our Mutual Friend,* is the historical material introduced about the drug business as it was conducted during the latter part of the nineteenth century.

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Book Notes is the title of a new book monthly published by Edwin Valentine Mitchell, of Hartford, Conn.

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Edith Wharton's new novel, *A Son at the Front,* will be published serially in *Scribner's Magazine,* the instalment to begin soon.

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That two plays, so alike yet so widely different, as *To Love* and *La Tendresse,* should run contemporaneously on the New York stage is a rather curious coincidence. Both were translated from the French by the actresses playing the leads in the current productions, and the theme of both is the so-called unfaithfulness of a woman to the man whom she really all the while loves. It is in the motive given for this deflection from the conventional path that the plays differ so widely. In *La Tendresse,* Marthe, played by Ruth Chatterton, states that she temporarily yielded to the advances of her young lover because she felt that by so satisfying the demands of her nature she could mean much more to her idolized Paul, a literary man who could not give her all the time and attention she craved. When Paul was unable to see things in this light, she grovelled monotonously and rather disgustingly for half an hour, beseeching to be taken back to bed and board, but was finally driven forth "completely devastated," to use a popular term quite appropriate to this orgy of sentimentality and sob stuff. The agonizing monotony of this lengthy expulsion was due perhaps to a limited interpretation of the French original, for, in spite of the mediocre translation used, hints were revealed of a picture of the boundless emotional variety of the Latin temperament. In *To Love,* it was readily understandable how Hélène, isolated in her vast country estate, fell under the charm of the magnetic Challange, especially since her husband insisted that the former be received as an intimate friend of the family; and later, when the lure of the younger and more vital man had become too strong, at first absolutely refused to condone the circumstances or to understand, and then released her.

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New Publications Received.

CHLOROFORM ANESTHESIA. By A. GOODMAN LEVY, M.D. New York: Wm. Wood & Co., 1922. Pp. iv-159.

ANNUAL REPORT OF THE STATE HOSPITAL COMMISSION, State of New York, July 1, 1920, to June 30, 1921. Pp. 199.

TUBERCULOSIS AND THE COMMUNITY. By JOHN B. HAWES, 2nd, M.D. Philadelphia and New York: Lea and Febiger, 1922. Pp. iv-168.

SYPHILIS OF THE INNOCENT. By HARRY C. SOLOMON, B.S., M.D. Washington: United States Interdepartmental Social Hygiene Board, 1922. Pp. iv-239.

Practical Therapeutics

SIGMOIDOSCOPY.

By B. B. Vincent Lyon, M. D.,
Philadelphia.
and Henry J. Bartle, M. D.,
Philadelphia.

Our reason for presenting this paper is twofold; first, to bring to your notice a modification of the older type of sigmoidoscope, and second, to urge that a sigmoidoscopic examination be made more frequently in the routine diagnostic survey of a patient.

We will first take up the description of the instrument, which is simply a new type and not a new instrument. It embraces the better points of many of the old instruments so that we have at last a practical sigmoidoscope for use in examination or treatment. The first important feature of the instrument is the diameter of the lumen. The Tuttle and the Lynch scopes are seven eighths of an inch in diameter. These we found too large for routine use as the patient was often distressed by the passage of a scope of such a diameter, and consequently this important examination in the routine study of our patient was often not attempted at all, or abandoned after a first unsuccessful or painful examination, especially in nervous women. Dr. Horace Soper, of St. Louis, told us that he was using a smaller lumen scope, and on endeavoring to purchase such an instrument we found that the short Axtell was the only one that had a barrel of smaller diameter. We then designed one of our own with a barrel five eighths inch in diameter and lighted at the distal end from the operator, thus requiring a light carrier and one of the smallest type of lamp, similar in construction to the Tuttle scope. This had many disadvantages in that the lamps frequently burned out or made poor contact, so that often the light carrier would have to be withdrawn to readjust the lamp as the light suddenly failed, which caused considerable loss of time. Furthermore, when air dilatation was attempted the fitting on the eye piece, which is usually more complicated in the light carrier type of sigmoidoscope than in the older types, allowed the escape of much of the air directly into the operator's face.

With these difficulties to be overcome we conferred with Mr. James Brown, of Philadelphia, and with his cooperation evolved the present sigmoidoscope, by taking the lumen diameter measurements of the Axtell (five eighths inch) and having scopes made running to eight, ten, and twelve inches in length. The Lynch type of illumination of our older scopes had been so satisfactory from the operator's viewpoint that we adopted it by modifying it to this smaller barreled scope. The result has been all that was hoped for. The illumination is perfect and always of equal distribution throughout the whole field. It is dependable, as the lamps do not become easily unscrewed, thereby making imperfect contact. The lamp itself is large enough to stand fairly rough handling as compared with the smaller lamp. It does not burn out so readily since it takes a greater voltage and does not require so fine an adjustment of the rheostat. This feature affords a great saving of time in operation. The lens, fashioned in the end of the lamp bulb, combined with the shield lens, throws a straight beam of light through the tube which gives almost as satisfactory illumination when sent through the twelve inch scope as in the ten or eight inch ones. Then, too, the lamp socket is eccentrically (peripherally) placed in the eyepiece so that it is out of the way and does not obstruct vision or prevent instrumentation. The whole eyepiece fits into the tube by a tapered socket or cone connection and a glass diaphragm or window closes the eyepiece by a threaded joint. Thus no leaks can occur if one desires to use air dilitation, which is rarely required during the insertion of this scope. The spoon is very much like a dull uterine curette of small size mounted as is the applicator. Current for the lamp can be supplied from a storage or wet cell battery or from the adjustable reostat that can be screwed into a universal socket of the direct or alternating street current of 110 volts. We find the latter most satisfactory.

METHOD OF USE.

The barrel of the scope and obturator are placed in warm water, to bring them up to body temperature, and then assembled by pushing the obturator within the barrel. The tip of the scope, including the protruding portion of the obturator, is anointed with white vaseline. The instrument is then ready for insertion. The patient, with corsets removed, takes the knee chest position, kneeling with thighs perpendicular to the table and with breast lowered to and in contact with the table top, with her head turned to one side, and resting on a small down pillow. The arms are stretched above the head, one in front of the face and one behind the occiput. A sheet with an eight inch fenestra is so draped about the patient's buttocks that the anus only is exposed. The anus and labia may be dusted over with a scented talcum powder to modify possible disagreeable odors. The index finger, hooded with a clot and lubricated with vaseline, is first introduced to digitally palpate the anus for tonicity of the sphincter, direction of the canal, and actually to examine the crypts and the rectum. It is always well to examine the prostate in the male and to make first a pelvic bimanual examination in the female, to determine the position of the uterus, the presence of tumors and to note particularly the possibility of infiltration of the left uterosacral ligament; as in our experience, next to tumor and redundancy of the sigmoid, this has been the most frequent cause of failure to pass the scope into the sigmoid.

The tip of the warmed scope is then applied to the anus and pressed forward into the anal canal with the right hand, while the left hand presses the barrel of the scope gently downward toward the floor, thus taking the pressure of the advancing tip of the obturator away from the posterior commissure, the most sensitive portion of the anus. The patient may be asked to strain a little, but this is not often necessary. When the scope moves freely and has been inserted about two inches, never further, the obturator is withdrawn, the eyepiece with its glass window screwed on firmly is applied and finally the electric cord is attached. The operator's eye is applied to the window and a view of the rectal mucous membrane is obtained. By pointing the end of the scope to the left (rarely to the right or posteriorly) the first rectal valve is seen and the scope is gently inserted beyond this and the other two valves, sweep in the end of the scope toward the right as you ascend. At the third valve, or just beyond it, the first natural obstruction, O'Byrne's sphincter, is reached, which is the main element of the recto-sigmoidal apparatus. So far no fecal masses should have been encountered as the rectum normally should be empty and the normal activity of O'Byrne's sphincter provides resistance to the downward passage of the sigmoidal fecal content until defecation is begun, and will often impede the introduction of the tip of the scope into the sigmoid. If you watch closely you will often see this sphincter alternately contracting and relaxing (except in the atonic type of bowel where it will not be seen at all). During relaxation you can gently slip the end of the scope through and then progress is usually fairly easy up the sigmoid to a total of eight, ten or twelve inches of scope length.

If the sphincter is found to be tightly contracted the patient is instructed to endeavor to relax as much as possible while the left hand gently makes pressure on the umbilical region, and thus supports some of the weight of the abdominal contents. This at the same time determines how well the nervous patient may be following your suggestion to relax. Should this not be sufficient to allow entrance to the sigmoid, or if, having entered, you find it too spastic for examination even with air insufflation, it is well to inject through the scope ten to twenty mils of a saturated magnesium sulphate solution as suggested by Soper, when relaxation will occur in five minutes or less. The solution usually runs up into the sigmoid, but any pocketed pools may be easily mopped out with a cotton tuft wound on the tip of a long applicator. Procedure up the sigmoid should then be unimpeded.

It may be that a fecal mass will be met, but this can frequently be circumvented by pushing the tip of the small scope to one side or a long, dull specimen curette (spoon) can be inserted through the scope after removing the glass window and the mass pushed to one side as the scope is advanced. Rarely (in five or ten per cent. of primary examinations) gentle air inflation with the hand bulb will have to be resorted to to overcome spasm. This is one of the advantages in the use of this small scope as air distention is rarely required in its use. The air distention of the bowel causes much of the pain in sigmoidoscopic examinations. After primary sigmoidoscopy, and particularly if it has been necessary to inflate the bowel to introduce the scope, it is well to allow the patient, with the scope inserted to the point at which you stopped, to get out of the knee chest posture by gently rolling over into the left lateral position. Then, by gentle massage of the abdomen over the transverse and descending colon with your left hand, most of the air that has entered the colon can be expelled through the scope as it is slowly withdrawn down to, but not through, the anus.

The scope now is just within the anus and we proceed with the examination by slowly drawing it out as we look through it, cautioning the patient to resist the desire to strain as we do so. Here, then, if we have not previously made an examination of the anus with other instruments, is our only chance to view the internal hemorrhoidal veins, the columns of Morgagni and the anal mucous membrane. While we will not see them in their natural condition, for we must remember that this instrumentation has somewhat irritated the whole anal ensemble, yet this view should be had to get a general idea of any gross pathological defect that may be present.

If the scope is withdrawn with the patient in the knee chest position, air left within the colon may cause colic lasting several hours, which is quite as bad from the patient's point of view as pain caused by the insertion of the instrument. At least the patient remembers the experience unpleasantly, and while this complication does not occur frequently, it is embarrassing enough to be avoided by this simple procedure. Should this aftercolic occur, and it may not come on until a half hour or more after instrumentation, it is best controlled by the administration by mouth of benzyl benzoate, thirty to sixty minims in cool water, and by having the patient, while lying, change from either lateral to supine or prone positions alternately, with gentle massage of the abdomen and by the application of the electrically heated pad or hot water bottle.

A final word about the difficulty of passing this or any other instrument in a patient with a redundant sigmoid. The tip of the scope after progressing a short distance in the higher rectum or lower sigmoid will apparently enter a blind pauch which seems to be the end of the canal and search as you will there seems to be no way of going further with your examination. Here if you slowly withdraw the scope and carefully watch the bowel wall you may see one part that tends to fall away from the end of the scope. If you will endeavor to hook the scope around the fold that will soon appear on slightly further withdrawing the instrument, you will frequently be able to get well up a sigmoid that on first endeavor seems quite inaccessible to examination.

We wish, in closing, to lay especial emphasis on the importance of making examination of the recto-sigmoid after a normal bowel movement and not after one produced by a physic or enema. The true condition of the mucous membrane cannot be determined by inspection after one or the other of these procedures has been resorted to. A mildly atrophic type of mucosa may appear swollen and show an outpouring of mucus as the result of irritation, and you will therefore be led astray in your diagnosis. In cases with incomplete evacuation it may be impossible to view properly the sigmoid because of a too great fecal residuum. Here it may be necessary to clean out the feces before a good view of this zone can be obtained. A good procedure to follow for this purpose is to instil through the scope (introduced as far as possible) one hundred mils of equal parts of saturated solution of magnesium sulphate and of water. This is to be used only in the markedly spastic cases. Where a state of atony exists (or perhaps even in the mixed forms with atony predominating) a mixture of equal parts of the saturated solutions of magnesium and sodium sulphate in an amount of from fifty to one hundred mils is a much better solution to use. The scope is slowly and completely withdrawn and the patient is turned on the left side for a few minutes. Usually within ten to fifteen minutes the patient has a desire to empty his bowel and usually does successfully empty the lower colon and this permits of a satisfactory inspection of the rectosigmoid. This procedure is one suggested by Soper and is an excellent one. However, it is open to the same criticism as expressed in this paper in regard to the effect of purgation or enema, namely that even ten to fifteen minutes of the local action of this salt may completely change the physical appearance of the mucosa.

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INCARCERATED HERNIA IN A MAN AGED NINETY-THREE.

With Fishbone in the Appendix.

By John F. X. Jones, M. D.,
Philadelphia.

As incidents of surgical operations on patients over ninety are not common in the literature, perhaps the following case may be of some interest.

Case.—Louis G., aged ninety-three (born March 15, 1829), was referred to St. Joseph's Hospital, May 7, 1922, by Dr. C. J. Flynn, presenting symptoms of acute intestinal obstruction and an irreducible swelling in the right groin. Thirty years ago, while attempting to lift a barrel, he had been "ruptured." He had been able to reduce his hernia until the day preceding his admission to the hospital. About two hours after he entered the hospital, with the aid of Dr. John B. Flick, I incised the hernial sac, using local anesthesia (one half of one per cent. novocaine). The hernia was inguinal and indirect, and the sac contained cecum and an inflamed appendix. Removal of the constricting pressure from the neck of the sac caused the color of the bowel to change from purple to normal. Appendectomy was performed and the bowel returned to the abdominal cavity. High ligation with removal of the sac was followed by plastic repair of abdominal wall. For several days the patient tore the dressings from the wound daily, declaring that the plaster placed there "had done no good." In spite of these irregularities in the aftertreatment there was operative recovery. Stitches were removed on the eighth day. Healing was by first intention. The patient was placed in a chair twenty-four hours after operation. He died on the eleventh day (May 7, 1922) as a result of pneumonia.

REPORT OF DR. JOSEPH A. MOORE.

Specimen consisted of appendix which is thickened and congested. On section, the lumen was observed to contain fecal material. In the tip of the appendix there was a fishbone attached to the distal end. Microscopically, there was a moderate degree of round cell infiltration which involved the mucous and, to some extent, the submucous coats; catarrhal appendicitis; foreign body in the appendix.

LITERATURE.

In discussing a paper on Results of Surgery in the Aged, by J. P. Tuttle (1), a Dr. Hart said that, in China, he had operated upon a man of ninety. E. F. M. Neave (2) has recorded an operation for strangulated hernia upon a woman of ninety. W. H. Arthur (3) amputated through both legs of a man of eighty-nine. C. W. Branch (4) performed a leg amputation upon a patient of ninety-four. A. C. Helm (5) reported a herniotomy upon a woman of ninety-seven who lived to celebrate her one hundredth birthday. W. H. Weber (6) operated upon a man of ninety-three for strangulated hernia. F. S. Clinton (7) performed an amputation through the thigh of a Shawnee Indian who was one hundred and eight years of age. In all of these cases, unlike mine, the patients lived.

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The Therapeutics of Emetine.—R. N. Chopra and B. N. Ghosh (*Indian Medical Gazette*, July, 1922) present the following summary of their paper. The most important point to be appreciated is that emetine is a very powerful drug having a toxic and cumulative action. Its value has been fully established in amebiasis and for this reason cases should first be carefully diagnosed before being treated with emetine. The size of dose and length of administration demand most careful consideration. The physician should be on the watch for toxic effects, and the patient kept in bed, carefully dieted, and the pulse rate recorded daily. The drug must be stopped on the appearance of any toxic symptoms. Special care should be taken that convalescents who have undergone a course of emetine are allowed up gradually and if there should be any increase in the pulse rate, made to go back to bed. As regards the dose and length of treatment, one grain administered subcutaneously every day for twelve days will cure most cases though some give half a grain daily by the mouth as well, in the form of keratine or salol coated pills, making a total of eighteen grains. If emetine by the mouth cannot be tolerated the course of injections may be increased up to a maximum of fifteen grains. Larger doses than this in a single course are not advised, and if amebic cysts are found afterwards, the course should be repeated, but if possible not within a month. Emetine bismuth iodide is given in three grain doses for twelve successive days, but some patients cannot tolerate these large doses, while in others the feeling of depression is just the same as with emetine. The dose may be reduced in such cases. Diarrhea often occurs during the course of bismuth emetine iodide but is usually a favorable sign.

Proceedings of Societies

AMERICAN THERAPEUTIC SOCIETY.

Twenty-third Annual Meeting Held in Washington, D. C., May 1 and 2, 1922.

Dr. Robert D. Rudolf, of Toronto, in the Chair.

Therapeutic Value of the Duodenal Tube.—Dr. Charles D. Aaron, of Detroit, presented a paper on this subject, which is published on page 648 of this issue.

Dr. Jacob Diner, of New York, in discussing the paper, said that it had been his good fortune two years ago to do some work in the Far East. This had been preceded by extensive hospital work, and his experience had been that when invasion of the mucosa commenced the case was practically hopeless. Amebic dysentery was frequently fatal, yet, if invasion of the submucosa could be prevented the cases could be handled easily and recovery was prompt. On the assumption that by diminishing peristalsis and by putting the digestive tract at rest as soon as possible, by means of a diet of the minimum possible requirement, it was relieved. Benzyl benzoate had been found to be one of the best preparations for the purpose of preventing peristalsis.

Dr. W. J. Mallory, of Washington, D. C., said he had one objection to the treatment of gastric ulcer by means of the duodenal tube. One of the measures by which it was hoped to promote healing was the prevention of the accumulation of free hydrochloric acid in the stomach. Although by this method food passed through the stomach, hydrochloric acid was still secreted and acted unhindered on the ulcer. It would seem that this method was not as valuable for healing the ulcer as the complete neutralization of the acid by means of a suitable diet and alkalies.

Dr. T. G. Schnabel, of Philadelphia, said he had had cases of gastric ulcer x rayed before this treatment and the ulcer was perfectly visible, and he had also in one case seen the ulcer through the gastroscope, both of which were of long standing, and this duodenal treatment Dr. Aaron described had been employed with complete recovery as a result.

Dr. Aaron said that the ulcer would heal without paying any further attention to it. For the first twenty-four hours the patient might complain of a burning sensation, but it soon passed off and without giving any alkalies, the ulcer would heal.

Biliary Drainage Through Duodenal Intubation.—Dr. John C. Hemmeter, of Baltimore, read this paper, which appears on page 645 of this issue.

Dr. Charles D. Aaron, of Detroit, wanted to know whether Dr. Hemmeter believed from his work on the action of the magnesium sulphate on the liver cells, whether this magnesium sulphate when introduced into the duodenum acted upon the gallbladder to contract it. Did this absorption, or the presence of the magnesium sulphate in the duodenum contract the liver cell by the law of contrary innervation and the gallbladder retain and give bile, or would the injection of magnesium sulphate intravesically act as a stimulant to the liver cell, the law of counter intravention not applying?

Dr. Truman G. Schnabel, of Philadelphia, said that he had been much interested in the question of flushing the duodenum with magnesium sulphate. Many assertions were being made as to the value of the duodenal tube; some quite reasonable, others extravagant. The examination of the duodenal contents might yield valuable information and the practice of duodenal lavage with the duodenal tube did seem on some occasions to be followed by benefit. In flushing the duodenum with magnesium sulphate it had been contended that it was necessary to deliver the solution directly upon the papilla of Vater in order to bring about the socalled contrainnervation existing between the muscle of Oddi and the gallbladder. If, with the perforated tip of the duodenal tube properly placed in the duodenum, the patient drank a magnesium sulphate solution alongside of the tube, in a normal case, after five minutes, a dark colored solution of bile began to flow from the other end of the tube. This seemed to show that the gastric secretion did not render the magnesium sulphate solution ineffectual in this connection. Every time one took a "dose of salts" the biliary system was well drained. Many other substances did as well as magnesium sulphate. It was important to be quite certain that the end of the tube extended well down into the duodenum. Under the fluoroscope it could be demonstrated readily that a bismuth meal introduced by way of the duodenal tube might flow back into the stomach unless the tip was in the third or fourth portion of the duodenum. In many cases one might believe that he was feeding transpylorically, when as a matter of fact the meal might be returned into the stomach. This did not give the stomach the rest so much desired.

Duodenal lavage had been practised in a number of cases during the course of a laparotomy, and in no instance was a contraction observed on the part of the gallbladder, although the socalled B bile had been obtained. They had also observed the duodenal tube properly placed in the duodenum and no bile colored fluid returned after lavage. The influence of anesthesia and the conditions surrounding a laparotomy must be taken into consideration. Duodenal intubation at the present time seemed to be one of the diagnostic props in biliary diagnosis.

Dr. Hemmeter explained by chalk sketches on a blackboard what was meant by contrary innervation.

Allergy in Its Relation to Internal Medicine.—This paper was read by Dr. W. W. Duke, of Kansas City, and published in the November 15th issue.

Intestinal Infections and Toxemias and Their Biological Treatment.—This paper, by Dr. N. Philip Norman and Dr. A. A. Eggston, of New York, appears on page 623 of this issue.

Dr. Louis M. Gompertz, of New Haven, Conn., in discussing the paper said that while he believed that open infections were extremely important, he did not believe that they were as important as Dr. Norman believed. One could not blame all the ills to which mortal man was heir to poor teeth. By implanting colon bacillus we got rid of autointoxication; its products were minimized and in that manner many of the conditions which were the result of autointoxication were eliminated. Bacillus bulgaricus could not be implanted in the intestinal tract. Bulgaricus acidophilus through its use can minimize intestinal infection and get rid of those symptoms of autointoxication.

Dr. Norman, in reply, said that Dr. Gompertz had misunderstood him a little. Blaming the teeth for everything; blaming the colon for everything; blaming the gallbladder for everything, had been the trouble with medicine. They had all been trying to fix their eyes on one thing, which was not the way of the great specialists. Only by looking at every patient from a broader point of view was there biological hope. Otherwise they were all failures.

Diet as a Therapeutic Measure.—Dr. W. H. Mercur, of Pittsburgh, read a paper on this subject.

Dr. L. F. Bishop, of New York, in discussing this subject, said that the gasoline engine might be used as a simile in explaining it. The heart was like an engine and ran by explosion of food products and there must be sufficient calories present for every explosion. Proteins represented the new parts that had to be put into an engine once in a while. A good engine did not need many new parts, but it did need fuel always. Many suffered from marked depression in heart action who had been undergoing injudicious reduction diets. They might lose their lives after absolute deficiency of calories in their diet.

Dr. Jacob Diner, of New York, said it was quite true that new parts were needed only occasionally and the gasoline quite often, but the radiator must also be filled. Many patients forget the matter of bulk in diet. Certain classes, particularly those who came from the Eastern part of Europe, were not accustomed to vegetables or salads. Their diet consisted of proteins, carbohydrates, and fats, but cellulose did not enter into their calculations. As to bulk, they went to excess in the food substitutes. Another matter that seemed to have been overlooked was how to handle the food stuff they had introduced into their systems. Most people would say that they chewed meat very carefully. It was found that carnivorous animals did not chew their food; herbivorous animals gave up much time to mastication. Digestion should begin in the mouth. Two matters of importance were, to fill in with bulk which was not productive of tissue fuel or energy, and to chew carbohydrates.

Dr. R. D. Rudolf, of Toronto, said that Dr. Mercur had left out one thing, and that was the spark. Colonel McCarrison had compared the vitamines to the spark. The energy was produced by the foods and corresponded to the petrol of an engine.

Dr. Edward E. Cornwall, of Brooklyn, said that the importance of the use of diet scientifically in disease was going to become more and more widely recognized, he was sure, because physicians were coming to realize in how many diseases, especially chronic ones, a large part of the treatment consisted in giving a proper diet. In prescribing a diet, the physician must make it plain to the patient just what he wanted him to eat. The dietetic prescription must be full and complete and it must be written clearly. Dr. Cornwall said that practically all his patients got a diet that was written out definitely so there was no getting away from it. He specified what, how much, and when, with such changes in articles of food as might be allowed. He had a printed blank form, which made it easy for him to do this, that is, generally in chronic cases. In special cases he wrote out the diet without the aid of the blank. The proper prescription of proteins was important. As was well known, all varieties of protein were equally suitable in the diet. The protein of milk, animal flesh and eggs were perfect proteins which paralleled the needs of the body, while vegetable proteins differed considerably in their component aminoacids from the protein of the body. But of the ideal proteins, some were more suitable in some conditions than others. Take typhoid fever, for example. If these patients were fed milk they received exactly the same protein as was found in meat, and they take it much better than if given in meat; in fact, if given the protein in the form of meat they would probably die.

Dr. Mercur, in replying to Dr. Cornwall, said it was a new idea to him that proteins were not found in the same form. The various proteins, whatever their source, varied in the ease of their digestibility. Most normal, healthy individuals could digest almost any kind of protein. A sick person should be treated by giving him a diet list of easily digestible proteins and carbohydrates. It was most helpful in difficult feeding cases to have such a list of proteins which took less energy to convert into albumen. In regard to the digestion or rather the assimilation of fat, it was an interesting clinical observation to note why certain persons could take so easily when they were so easily upset by fat in the form of cream.

Medical Treatment of Gastric Ulcer.—Dr. Truman G. Schnabel, of Philadelphia, read a paper on this subject in which he stressed the use of a rice water mixture.

Dr. J. I. Johnston, of Pittsburgh, said that a great many of the cases discussed by Dr. Schnabel could have been treated in an ambulatory way. It was quite easy to get these patients to cooperate with the physician. He had six patients being treated in an ambulatory way and all were at work.

Conservative Treatment of Pneumonia.—Dr. E. E. Cornwall, of Brooklyn, read this paper which was published in our issue for November 15, 1922.

Dr. J. I. Johnston, of Pittsburgh, Pa., in discussing the subject, said that he came from a district where pneumococcic pneumonia was prevalent and the mortality high. While he subscribed to Dr. Cornwall's conservative treatment to a certain extent he always looked upon even the mildest case with the probability of a hard fight. He started early and digitalized his patients thoroughly. One point which he wished to emphasize was the value of strychnine in large doses late in the disease, when the respiratory centre was fatigued. Strychnine for cardiavascular failure was not used and it had fallen somewhat into ill repute, but for a support to a fatigued respiratory centre its value seemed great.

(To be continued)

Abstracts from Current Literature

GASTROENTEROLOGY.

Sins and Sorrows of the Colon.—Arthur F. Hurst (*British Medical Journal,* June 17, 1922) states that the motor function of the colon depends upon tone and peristalsis, which are mutually independent. The tone of the colon depends largely upon the bulk of its contents and varies continuously according to the amount of feces and gas present in each segment at the moment. Serial roentgenograms show that the colon undergoes "mass peristalsis" immediately after a meal, due to a gastrocolic reflex from the entrance of food into the empty stomach. After absorption of the soluble substances of the intestinal contents, the mass peristalsis of the upper colon deposits the feces in the pelvic colon, where they remain until the first peristaltic wave of the following morning occurs—the result of the stimulus of getting up and dressing or of breakfast; this is followed by the reflex process of defecation, when the feces enter the empty rectum.

The treatment of obstinate constipation requires the taking of roentgenograms after the use of aperients has been discontinued. In this way the presence of adhesions can be determined. Kinks and colonic stasis rarely cause ptosis of the colon, except when they are excessive. Most cases of constipation are due to inefficient defecation, the intestinal rate of movement being normal. In these cases the patients require only reeducation in the act of defecation and graduated glycerin enemas. Other cases show stasis in the proximal part of the colon. An accurate diagnosis shows what form of treatment is indicated: diet, drugs, massage, exercise, and in general colonic stasis, intestinal lavage. The early stages of a tumor are rarely shown by radiography.

The term colitis is often loosely applied to cases without any evidence of inflammation, often resulting in severe hypochondriasis. Colitis should be diagnosed only when warranted by an examination of the stools and by sigmoidoscopy. Excessive amounts of mucus may result from mechanical and chemical irritation, as from hard feces; if feces accumulate in the rectum the mucus is unformed, but if they accumulate in the pelvic or more proximal part of the colon the mucus is coagulated, producing a membrane which is passed in shreds or tubular casts; microscopically, there may be desquamated epithelial cells but no pus cells or other evidence of inflammation. The sigmoidoscope shows a healthy mucosa. Colitis is more likely to be present if the feces are soft or fluid, but this may also be due to an aperient. Pus in the stools always indicates a pathological condition. In the absence of hemorrhoids, bright red blood is significant; without mucus or pus it is probably due to a rectal polyp, but if it is not found acute hemorrhagic colitis, ulcerative colitis, dysentery, or cancer is usually present. Sigmoidoscopy is most essential in arriving at a proper diagnosis.

Many cases of socalled toxemia, diarrhea and intestinal stasis are due to the abuse of purgatives; the same applies to the injudicious use of intestinal lavage. The lavage is indicated in mucomembranous colitis. The fluid used should be nonirritating. Patients should try to have a natural movement before resorting to lavage; if this is impossible, paraffin should be given and, if necessary, a minimal dose of senna. Lavage is of great value in the severe forms of colitis, especially the ulcerative, in which antiseptics and astringents are applied locally. The best solution is that of albargin, one grain to one ounce of water. As it has been proved that it is impossible for a rectal tube to pass beyond the pelvirectal flexure, the tube should be introduced a distance of only two inches beyond the anus and the fluid should be allowed to run in slowly and at a pressure not exceeding twelve inches of water and no more than a pint and a half in amount.

The indications for surgery, except for cancer, diverticulitis and acute or chronic obstruction, are few. Antidysenteric serum has been used in place of appendicostomy or cecostomy and is useful except in rare cases. Short circuiting operations are indicated in intestinal stasis only in rare and neglected cases.

A Physiological Explanation of Pain Due to Functional Disturbances of the Muscles of the Colon.—T. Stacey Wilson (*British Medical Journal,* June 17, 1922) calls attention to the fact that the muscular fibres of the circular coat of the colon have the power of becoming rigid in an extended condition and of thus turning the colon into a tube with rigid walls and a definite lumen whose diameter varies in different cases, sometimes as much as an inch and a half or more. Sherrington explains this by showing that muscular fibres, in addition to the power of contraction, have another form of activity—postural activity, which aids in maintaining the posture of the body. It is not a true tonus, because the muscles can exert considerable force, if voluntary contraction is eliminated, without definite contractile activity: a muscular fibre may become rigid in any condition of extension or contraction and of retaining this attitude for a long time or of varying it, as may be necessary, under nervous control. Normally, these types of muscular activity must be perfectly coordinated, but the author refers to cases in which the lack of coordination resulting from an abnormal amount of postural activity interferes with normal peristalsis. This occurrence produces pain, proportional to the force of the opposing types of muscular activity.

Muscular activity in the colon produces certain afferent impulses which produce relative vasoconstriction of the cerebral vessels and which are inhibitory to the systemic circulation. With an excess of postural activity, a conflict between the two opposed types of activity results and produces an abnormally powerful afferent impulse in the sympathetic nerves of the colon. Patients showing increased hardness and tenderness of the colon also show symptoms of inhibition of the normal vasodilatation accompanying cerebral activity and that of the muscles accompanying physical exertion. They usually complain of brain weariness and mental inertia, etc., which are differentiated from neurasthenia by the ability to work after abnormal effort to get started. The muscular element expresses itself in lassitude and weariness which are not due to true exhaustion because the symptoms soon pass off after brisk effort. The symptoms are intermittent, occurring especially in the morning. The clinical features of pain are such as to confirm the theory that they are reflex nervous symptoms; the severity of the pain varies according to the amount of postural hardening of the colon and the time of its occurrence corresponds to that of the reflex symptoms. Not infrequently the two sets of symptoms alternate in the same patient and a sensation of pain may be substituted for one of depression by intentionally inducing pain in a tender portion of the colon. In this way the afferent impulses leading to some other parts of the brain and causing mental misery are deflected to the sensory tracts with the result that pain takes the place of mental discomfort. The pain is usually localized over the spot where it probably arose, but is usually referred or segmental in character.

It must also be recognized that nervous impulses arising in the colon and passing to the brain along sympathetic nerve paths can directly disturb that portion of the brain or the functions upon which the sense of well being depends and can also produce an acute mental misery which truly represents the physical pain which the patient would have felt if the afferent impulse causing it had been transferred from the sympathetic to the sensory tracts of the cord. These cases readily yield to treatment which lessens the amount of postural activity of the colon.

Differential Diagnosis of Acute Appendicitis, Pyelitis and Salpingitis.—F. D. Worthington (*Virginia Medical Monthly,* June, 1922), aside from the history of the case, emphasizes the following differential points: In acute appendicitis the temperature is elevated, but not markedly, seldom exceeding 101° F. unless peritonitis has developed. In pyelitis the temperature may reach the highest limits while in salpingitis it will usually ascend rather high at some time during the day. Elevation of pulse with appendicitis is common and may be more significant than temperature. In pyelitis it is relatively slow as compared to the temperature, while in salpingitis it is elevated with the temperature. Respirations are more limited with appendicitis than with other conditions and may be elevated for this reason. An extensive pelvic peritonitis may also limit the abdominal excursions, but pyelitis has no influence in this respect. The urine examined should always be a catheterized specimen. Frequently there are no pus cells nor red corpuscles in the urine during an early pyelitis, and almost as often one finds a few in appendicitis and salpingitis. A large quantity of these organic sediments should arouse suspicion, at least. The leucocyte count is an aid. Whereas, in acute appendicitis one does not expect a count of over twenty thousand unless pus is present, in acute pyelitis it may vary from a moderate increase to a tremendous leucocytosis, depending on the extent of ureteral obstruction and the subsequent tension of pus in the renal pelvis. In salpingitis the count varies from slightly above normal to very high. The general appearance of the patient is helpful. The patient with acute appendicitis is the most quiet of the three and protects herself, particularly the abdomen. The pyelitis case may be restless, is usually flushed, but may feel quite well. The salpingitis case does not look as ill as the temperature, etc., would indicate. General abdominal distention is most common in the woman with salpingitis and is not rare in pyelitis. Other serviceable indications are the location of tenderness and the results of pelvic examination, though the latter may be misleading.

Chronic Inflammation of the Appendix.—C. Hamilton Whiteford (*Practitioner,* August, 1922) protests against the theory that chronic inflammation of the appendix is a disease of great frequency and easy diagnosis, a cause of much chronic abdominal pain and discomfort, and a cause of such diseases as gallstones and duodenal ulcer. The author also protests against the corollary that removal of the appendix results in the disappearance of the symptoms which the appendix is said to be producing. He asserts that the operation for removal of the chronic appendix not only fails to cure, but often makes the patient worse, and that attribution to the appendix of obscure abdominal discomfort hinders investigation into the causes of the pain. In the surgeon the theory induces laxity in diagnosis, while the small incision made in operating renders a thorough examination of the abdominal contents a mechanical impossibility. In the layman the failure of the operation to cure, as well as its aftereffects, is causing doubt as to the necessity for operation in acute appendicitis and mistrust of the surgeon. Hence he maintains that in the interests of both surgeons and patients the diagnosis of chronic inflammation of the appendix as a condition requiring operation should be abandoned.

Gastroenterostomy.—Pool and Dineen (*Annals of Surgery,* October, 1922) summarize as follows: A well placed gastroenterostomy empties the whole stomach adequately and quickly. If fluoroscopic examination shows incomplete or tardy emptying a technical fault may ordinarily be inferred. Even a well placed stoma occasionally is associated with serious sequelæ. First, there is always an appreciable risk of a gastrojejunal ulcer, variously stated as from two to three per cent. Second, symptomatic failures occasionally occur. In chronic indurated ulcers, especially those with some grade of pyloric obstruction, as represented by six hour barium retention, symptomatic failures have not been experienced. The rare symptomatic failures apparently occur after gastroenterostomies for small nonobstructing ulcers. It is our practice in all cases of suspected duodenal ulcer to determine before operation whether a six hour barium retention is present. If such exists we feel that a gastrojejunostomy is unquestionably justifiable if an ulcer is found at operation. If no six hour retention is noted, we endeavor to avoid a gastroenterostomy, although this is not always done, especially in large indurated ulcers. If there is uncertainty after exposure of the duodenum as to the existence of an ulcer, the lumen is opened and the mucous membrane explored. When a small nonobstructing ulcer has been demonstrated, either with or without the aid of this exploratory incision into the duodenum, an appropriate plastic operation on pylorus or duodenum, if feasible, with excision of the ulcer, is elected in preference to a gastrojejunostomy.

Gastric Ulcer.—G. Woolsey (*Annals of Surgery,* October, 1922) concludes as follows: 1. For ulcers, three to four or more inches from the pylorus, the choice lies between excision and mesogastric resection. On account of the better results I prefer excision and gastroenterostomy, except for ulcers with hourglass contraction and large indurated ulcers, especially those on the posterior surface. 2. For ulcers near the pylorus, or within three inches or so of it, I prefer the Polya method. It is easy, reasonably rapid, and has given the best results of any method. 3. In case the operation is done in two stages, or a gastroenterostomy has previously been done, the Billroth II method is the rational procedure, but the two stage procedure is rarely called for in cases of ulcer. 4. For ulcers at, or close to, the pylorus, especially such as cause a stenosis, a posterior gastroenterostomy is the simplest and safest operation, gives good results and may be the method of election for those not experienced in resection. It is quite possible for such an operation to benefit or cure ulcers remote from the pylorus. 5. The possibility of cancerous degeneration of a gastric ulcer would in general lead to its resection or excision, but, as was long ago pointed out by Kocher and others, such degeneration is quite uncommon in cases treated by gastrojejunostomy. In view, however, of this danger, whether we class it at a high per cent. with some or a low per cent. with others, I firmly believe in the complete removal of gastric ulcers by resection or excision unless the operative risk is greatly increased on account of the condition of the patient.

Pathogenesis of Gastric Ulcer.—Before discussing the results of his own laboratory researches on the pathogenesis of gastric ulcer, P. Brosotto (*Riforma Medica,* June, 1922) makes a detailed examination into the principal theories advanced on the pathogenesis of gastric ulcer. He cites and criticizes the hyperchlorhydria theory advanced by Riegel, Talma, and others, and asserts that the phenomenon is not a primary one, nor is it a condition sufficient to explain the pathogenesis. The vascular theory, associated with the names of Virchow and Klebs, he dismisses as untenable, for the reason that the experimental thrombosis does not produce an ulcer, but only some transitory, hemorrhagic effusions (notwithstanding the fact that, with the fastening up of the vessels, it was possible to have chronic ulcer). In the critical examination of the author the traumatic theory of Morgagni and P. Marie have also met with disapproval. He bases his theory of the pathogenesis of gastric ulcer in the relations which exist between the ulcer and the patient or latent disturbances in the nerve centres. In support of this proposition he undertook and carried out experiments on dogs with satisfactory results. Having cut the vagus at the neck, and administering repeatedly a solution of hydrochloric acid *per os,* the results were positive. He succeeded in producing gastric ulcer. He expounds the results obtained, the diminished motility of the stomach, delayed digestion, the mechanical modifications of the pyloric reflex by which evacuation is retarded and mechanical lesions easily provoked, determined by pressure from retained alimentation. The spasm of the vesical walls is not overlooked and the permanence of the lesion is demonstrated in the permanent perverted vitality of the cellular elements. If this condition does not always obtain, it must be explained by the functional assistance of the system of intrinsic gastric innervation of the Opeschowski ganglia; because gastric ulcer can only be determined when both systems are involved. Finally, the author discusses the relations of the endocrine glands—more especially the suprarenal capsule—to gastric ulcer. In this connection the author refers to experiments—cases of ulcer by reason of deficiency of the adrenalin hormone, with asthenia and general adenemia, anorexia and vomiting. He had disturbed the trophism of the gastric wall, had overexerted the power of the gastric juice and had produced gastric ulcer. At the autopsy there was found a pyloric ulcer which involved the mucosa and the musculature. These results must be explained by the anatomical and functional relations of the endocrine glands to the vagosympathetic system. Therefore, according to Brosotto, gastric ulcer is the result of a trophoneurotic disturbance which originates from another disturbance, which acts upon the vagosympathetic apparatus, the perfect functioning of which maintains the equilibrium of the gastric wall.

Certain Conditions Associated with Deficient Secretion in the Upper Alimentary Tract.—T. Izod Bennett and E. C. Dodds (*Lancet,* June 10, 1922) state that complete absence of gastric ferments may occur in healthy persons, as well as in dyspeptics, and that the increased rapidity of gastric emptying in such cases may be the cause of increased hunger contractions, aerophagy and flatulence. An increased secretion of mucus is occasionally also observed in these cases, being an indication of true gastritis, and may be secondary to a pulmonary or nasopharyngeal infection. In other rare cases there may be a delayed emptying, usually associated with marked visceroptosis. In a patient proved to have pancreatic sclerosis, the fall of the alveolar carbon dioxide tension, which normally occurs on the passage of food through the pylorus was absent. Patients having pernicious anemia show in addition to complete achylia gastrica, a marked diminution in the pancreatic fall of the alveolar carbon dioxide tension. Such patients on clinical examination have frequently been shown to have signs of pancreatic insufficiency. Similar pictures of alveolar carbon dioxide tension and achlorhydria have been found in severe secondary anemias and cachectic conditions. The authors maintain that the achylia of pernicious anemia is secondary to the blood condition. Cases of gastric carcinoma show at least four types on laboratory examination: 1, a type characteristic of extreme pyloric stenosis; 2, one characteristic of cachexia; 3, one with excessive secretion of mucus; and 4, one difficult to distinguish from benign achylia.

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Dyspepsia and the Conditions Underlying It.—Lord Dawson of Penn (*British Medical Journal,* June 3, 1922) states that dyspepsia may be due to causes within or without the stomach. Symptoms of chronic catarrh of the stomach are often associated with infections of the teeth, gums, tonsils, sinuses, appendix, or colon, all showing the same type of streptococcus. Clinically, dyspepsias fall into three groups: 1, those attended with pain thirty or forty minutes after food, with epigastric tenderness and relief from vomiting and occasionally hematemesis; 2, those with pain two or three hours after meals, with or without tenderness, relieved by food and alkalies—the hyperchlorhydria complex; 3, those with distention and flatulence predominant, without vomiting and bleeding and occasionally irregularity of the bowels. There may or may not be any structural lesions in any of the three groups. The typical lesion is gastric ulcer for group 1, duodenal ulcer for group 2, and cholecystitis for group 3, and all of them may be associated with a diseased appendix.

The cases of group 1 are mostly young women, anemic and constipated. Some show an ulcer and more a diseased appendix, but the majority show no anatomical lesion, the symptoms being due to a nonfunctioning colon, faulty liver metabolism, and the excretion of toxic products in the stomach, or to focal infections. Hematemesis does not necessarily mean the presence of a demonstrable lesion. Hyperchlorhydria may be due to many causes: it is associated with duodenal ulcer and less prominently with gastric ulcer. It is caused by lesions of the appendix and colon and also by functional disturbances of the colon and it may be associated with socalled nervousness or gout. The cases of group 3 are difficult to diagnose properly because of their variety of symptoms and their similarity to fatigue dyspepsia, nervous dyspepsia, colitis, myocardial insufficiency, anemias, hyperthyroidism, and diseased appendix or gallbladder.

Appendicitis may stimulate the underlying causes of any of the three groups, especially gastric and duodenal ulcers. The pain food time relationships are characteristic of ulcer, especially the duodenal. Gastric symptoms are produced by two factors: the reflex interference with gastric function and infection. Röntgenography reveals the character and speed of gastrointestinal movements and actual pathological changes. The movements depend partly on the opaque substance used—barium stimulates whereas bismuth retards. The normal stomach may show variations in shape, position and size, depending upon the muscle tone. A defect in the shape and outline of the cap is fair evidence of ulcer, adhesions, or pressure, and a normal cap excludes the presence of a chronic ulcer. A growth is shown by a deficiency of the shadow or a raggedness of the edge, but early cases may show nothing. Delayed emptying may be due to pyloric obstruction, atony of the stomach, or it may be associated with diseases of the appendix, colon or gallbladder, or heart and other diseases. Rapid emptying may be due to irritation from gastric catarrh, gastric ulcer, or an early growth, duodenal ulcer, chronic appendicitis, hyperchlorhydria, colitis, hyperthyroidism and irritability from nerve strain. Test meals and the bacterial and chemical examinations of the fasting gastric contents and duodenal contents are of considerable aid in the diagnosis.

In malignancies of the stomach the early symptoms are vague or even absent; pain may be absent until late, vomiting is rarely an early sign and hematemesis may be the first symptom; there is usually anemia and mental depression. Röntgenography does not always give evidence of the condition in the early stages, except when the tumor is secondary to an ulcer; serial röntgenograms taken at short intervals often help to make the diagnosis. Operation is always indicated on the slightest suspicion of cancer.

Experimental Pancreatitis.—E. Archibald (*Annals of Surgery,* November, 1921) in a study of experimentally produced pancreatitis says that infected bile, aspirated from the inflamed gallbladder, exercises a much more severe necrosing and inflammatory effect upon the pancreas than does normal bile. Chemical investigation of infected bile has not yet proved that this difference of effect is due to an increase in concentration of the bile salts as the result of bacterial action on the bile. Mild grades of pancreatic swelling, as estimated clinically, are certainly possible, and are represented by edema with early necrosis of the parenchyma, presumably the result of bile invasion. The clinical statement in operation records as to the presence of "a somewhat thickened and indurated pancreas" is probably a correct interpretation of fact in most instances. The gallbladder, under conditions of irritation from stone or inflammation, is probably able to go into strong muscular contraction, and the hypothesis is set up that such contractions may provide sufficient driving force to cause invasion of the pancreas with bile. The common duct sphincter is provoked to resistance not only by an acidity of the duodenal contents, but also by a sudden distention of the common duct through abnormal and unexpected rises of pressure in the gallbladder.

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The Alleviation of Pain in Severe and Fatal Illness

By J. LEONARD CORNING, M. D., LL. D.
New York.

Eloquence proclaims that "men fear death as children fear to go in the dark"—a great saying; yet in all the fear is not the same. The facts of history and indeed the happenings of every day affirm it, and such words as dismay, consternation, terror, and solicitude, anxiety, concern, and apprehension, trepidation, horror—these and other tokens of related meaning have all been fashioned by the mind to give a more precise expression to the variations in quality and degree of this emotion. Nor is the feeling in the individual by any means always the same. Biochemical changes, subtle and often baffling, attacks of various diseases, directly or indirectly, upon the central nervous system and even ideas of a fixed, depressive character, whether present during full consciousness or regnant in the chaotic cerebration of dreams and delirium may all impel to a fall in courage and a rise of apprehension in the subject.

To one called upon to assume the management in a case of severe and perhaps fatal illness, the recognition of these facts is of more than theoretical interest. The presence of delirium in a case of this kind constitutes a notable aggravation not merely because the patient may do himself an injury, a possibility foreseen and adequately guarded against by practitioners of experience, but more especially because of the tendency of the subject during periods of lucidity to confound the hallucinatioins and distorted ideas incident to his previous delirious condition with reality, so that a lowering of mental tone highly prejudicial to recovery is brought about. Nor is this surprising. Many persons, perhaps the majority, are dowered with little introspective aptitude, and hence their inability accurately to discriminate between morbid and normal states of consciousness. Unlike the horrific hallucinations and delusions of delirium tremens, most of which are usually speedily forgotten, so that they fail to deter the subject from resuming as soon as may be his alcoholic excesses, those which we are here considering, or many of them, are remembered, and being interblent, for the reason just stated, with the ideation of normal consciousness, form a mental incubus of no mean dimensions. I venture to stress the point, for it would seem that, when not wholly overlooked, it has been inadequately regarded.

TYPES OF DELIRIUM.

For convenience of discussion, two kinds of delirium have long been recognized: that occurring in insanity, and that met with in the course of acute diseases. It is with the latter that the practitioner is chiefly concerned.

Nearly sixty years ago Dr. Hermann Weber (1) described what he called the delirium of collapse. The diseases in which he had most frequently observed it were typhoid fever, typhus fever, pneumonia, acute rheumatism, erysipelas and cholera. Since the advent of influenza it has also appeared either as a sequence or as an accompaniment of that affection. Delirium may also develop suddenly or gradually after surgical operations. The intensity and duration of the mental disturbance are usually dependent upon the gravity of the disease or injury. In children delirium, of course, is quite common; even so slight a rise in temperature as 99.5° or 100° may suffice to produce it. Usually great impairment of consciousness and loss of attention and memory are the chief features, but in some cases there are frightful hallucinations with tearless weeping and screaming. A besetment of this kind occasionally merges into an agitated melancholy, lasting, in some instances, for several days. Cases illustrative of this were published by Clouston (2) many years ago.

The scope of the present paper does not permit of a further elaboration of this interesting phase of the subject. I resume, therefore, the discussion of certain more obvious factors which exert a modifying influence on the dread of death. Prominent among them are hardship and physical pain. While in Switzerland during the Franco-Prussian War of 1870, I was a witness of a striking exemplification of this. The fortune of conflict was at a low ebb with the French; and on a certain day, their last levies, under the command of General Bourbaki, brought to bay by the Prussians, met the hopeless

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situation by crossing into Switzerland. Disarmed there by the military authorities of the Republic they were conducted to the various villages and townships, and more especially to those of the French speaking cantons where everything possible was done by the hospitable inhabitants to mitigate their condition. They were indeed a sorry company, broken by hardship and disease, shuffling feebly through the narrow streets where lines of onlookers, under the thrall of sudden pity, stood silent. Only an occasional cough from the ranks broke the bruit of the decrepit locomotion.

Wending thus amid the boding hush, halfshod, their frayed and faded uniforms hanging limp from withered shoulders, above which sunken eyes peered forth with a kind of frozen fixity, they were as men with a short reprieve from death to assist in advance at the futile pomps of their own obsequies. And, in fact, in no long time many of them succumbed. They halted at length to be fed and cared for by the hospitable villagers. It was then that I succeeded in talking with some of them.

"You have had a hard time," I ventured.

"It is war," shrugged one.

"Life is hard," said another.

"But, yes," agreed a third, "it is life not death that one dreads."

I was a boy when I saw these men and talked with them, but what they were and what they said are not easily forgotten.

The influence of physical pain upon the desire to live is well known. A tragic illustration of this is seen in inveterate neuralgia, particularly that involving the first, second or third branch of the fifth nerve or all three of them. I have seen numerous cases of this kind in which, medication having failed, surgery was invoked, the several branches of the nerve being successively cut and ultimately even the Gasserian ganglion extirpated, all without effecting more than temporary relief. It is in such hopeless cases that, the will to live overborne by suffering, the subject in his extremity may resort to suicide.

Daunted by the finality of the individual disclosed by physical dissolution, there has always been rife in humanity an invincible disinclination to accept the somatic phenomena of death as decisive evidence of the end of conscious being.

BELIEF IN FUTURE LIFE.

In consonance with this antipathy, carrying, as it were, the will to live beyond the grave, have grown the unnumbered religious beliefs that have served as a prop to hope throughout the ages. With the validity of these beliefs medicine as such has no concern. In so far, however, as they are of any assistance to the suffering, and perhaps fatally ill, the physician is constrained to take cognizance of them. Inculcated in youth, at a time when experience is small and the powers of abstract reasoning rudimentary, these beliefs take solid lodgment in the mind, forming imperative concepts ineluctable even in maturity. It is quite foreign to the purpose of the present writing critically to examine these beliefs; enough that, while promising posthumous felicity many of them likewise maintain the existence of penalties of an appalling character reserved for certain individuals after death. What is of scientific interest about these anthropomorphic ideas of retribution projected beyond the grave, is the fact that they may be, and often are, the stuff of which the hallucinations and delusions of delirium are made. Even after recovery from his delirium the recollection of his experience may cause the subject poignant apprehension, the more so should he be unable to distinguish the morbid content of his delirium from the valid percepts and ideas of normal mental life.

Upon the attending physician devolves the obligation to combat the sinister significance ascribed by the subject to the hallucinations and erroneous ideas arising during his delirium. Efforts of this kind should be begun during the first appearance of lucidity and energetically pursued as frequently as circumstances permit. True, it is not possible to eradicate in the patient the recollection of his disturbing experiences, but by pointing out the inherent absurdity of these; and, most of all, by insisting that they are merely one of the consequences of disease, much may be done to allay his apprehension.

UNCONSCIOUS MANIFESTATIONS.

Dreams, sombre or horrific, are sometimes a disturbing adjunct in severe illness. While often confounded with reality, more especially in the ignorant and the young, they are certainly less prone than delirium persistently to haunt the memory. That sombre religious doctrines frequently constitute the prototypes of the delusions of the insane is common knowledge. The agitated melancholiac—trunk and head bent forward, forehead wrinkled, face the picture of misery, always in motion, reiterating that he has "committed the unpardonable sin"; that he is "damned forever"; that he is "abandoned by God" —this agitated type of depression may be met with in the wards of most hospitals for the insane at almost any time. A patient afflicted in this way is liable to commit suicide; and, indeed, all melancholiacs are potential suicides and should be closely watched. Despite the strictest surveillance, however, they not infrequently succeed in making away with themselves. Several accidents of this kind, without manifest negligence on the part of nurses or attendants, have occurred within my own professional experience.

Dismal theological doctrines, however, are by no means the only ones that find a distorted reflection in delirium. The pessimistic tenets of philosophers; the horrific climaxes of mystery stories; the chronicles of crime in the public press; the rumors of financial difficulties—these, and a thousand other dolorous clamors may influence its character more or less.

The effect of emotional shock in diminishing the desire to live is well known. Tragic illustrations are found in abundance in the news columns of the daily papers. A banker, suddenly faced with great loss and possible disgrace, shoots himself; a wife, dead in a railway accident, her husband makes away with himself; a child, inhumanly treated by its parents, immediately commits suicide—these and similar happenings help to swell the dismal chronicle.

CENTRAL NERVOUS SYSTEM.

In many cases of severe illness the central nervous system is profoundly affected. Apathy, depression and extreme weakness are the rule; while, as we have seen, the hallucinations and delusions of delirium are quite common. Mental disturbances of this kind are far less frequently met with as a sequence of surgical operations. The contrast between the facial expression of those suffering from severe internal ailments and those who have recently undergone surgical operations is striking: the faces of the first are wan, chopfallen, dejected; of the second, relatively bright, cheerful and sometimes even smiling.

ATTITUDE OF THE PHYSICIAN.

The words and bearing of the medical practitioner in the presence of one afflicted with severe illness are by no means a matter of indifference. No dispensation of obfuscate wisdom can offset the impolicy of the practitioner who enters the sick room with the air of a protagonist of funereal rites. Nor can any satisfaction of distorted conscience atone for the damage wrought in the patient by telling him that all is not going well, or worse, that he is faced by a dire or a fatal outcome. Admissions of this kind impair or destroy hope—one of the surest means of bringing to fulfillment the sinister outgivings of lugubrious augury. Very different in its effect is that benevolent casuistry which insists on a favorable interpretation of symptoms whenever possible; which glides as smoothly as may be over morbific threats giving rise to apprehension, and which refuses to concede a fatal termination even when confronted by unmistakable tokens of imminent dissolution. Some remarkable exponents of this necromancy of the sick room are found among the practitioners of medicine of an earlier day. Incomparably poorer in therapeutic resources than the medical men of a later time, they nevertheless not infrequently achieved truly astonishing results. Under the magic of their words and mien, fear was dispelled, hope awakened; while credulity, speelbound, was made to contribute its share towards winning to a favorable outcome. And to buttress all this, these great men invoked with pathetic diligence the crude pharmacy of their day.

It would be both unjust and untrue to imagine that the practitioners whom I have in mind were lulled by any false hopes as to the efficacy of either physical or mental agencies. They were indeed singularly free from the dominance of exaggerated opinions, whether optimistic or the reverse. Had their lives been prolonged to the present time, while viewing with admiration and astonishment the genuine accomplishments of their successors, they could not have failed to regard with disapproval and regret some of the faddish excesses of the age.

MEDICAL MEN OF TODAY.

To ignore the merits of the men of our own day, however, would be both unpardonable and absurd. True, the type has changed, but so have exactions. The demands upon efficiency were scarcely ever more urgent. The contributions made possible by industry and aptitude are truly amazing. If the older men excelled in generality these astonish by their concentration; if the first loom large by the reach of their accomplishments, these compel respect by a more restricted assiduity. Surely no reign of hurly-burly, no carnival of opportunism could of led these men to their goal.

While, in severe illness, the alleviation of mental pain is no small problem, demanding as it does both assurance and tact on the part of the practitioner, the relief of physical pain is often beset by difficulties greater by far. These difficulties arise from various complications, circumstances which must be reckoned with when the exhibition of this or that analgesic is in debate. Prominent among these are a weak heart, defective kidneys, impaired digestion and insomnia. I am well aware that this is by no means a full list of the fortuities that hamper the physician in his efforts to relieve the sufferings of his patient, but they are the principal ones, the ones with which he is only too commonly confronted when most anxious to exercise the good offices of his profession. To support a weak heart or urge to action kidneys already damaged more or less, and this despite the depressive action of analgesics, and more especially of opium derivatives, is not infrequently a task of such difficulty as to put a heavy strain upon the resourcefulness of even the most experienced therapeutist. Here an intimate knowledge of the reach and limitations of cardiac stimulants and diuretics coupled with ability to grasp the exigencies of the case in whole and in detail—these, and an obstinate unwillingness to accept defeat, will sometimes accomplish what premature discouragement would have made impossible.

Napoleon is said to have held that the art of war is simple enough to understand; it is doing it that is difficult (3). So here, in a relatively restricted field, it is easy both to state and apprehend the problem; to solve it, however, is sometimes, as well for pathological obstacles as therapeutic limitations, quite impossible.

CONCLUSIONS.

In concluding these desultory and rather inadequate observations, I venture to deprecate the practice of reducing the doses of opium derivatives as the subject of a painful and incurable disease nears the fatal climax. This is done with the idea of prolonging life to the ultimate minute, and in complete forgetfulness of the fact that extreme suffering is quite as capable of hastening the demise of the patient already hopelessly enfeebled as the cardiac depression wrought by large doses of morphine.

The better, the more humane, and the scientific procedure no less, is to continue the stimulation of the heart and the administration of the analgesic, augmenting the dose of the latter, should this be necessary, and increasing that of the former as much as may be.

By going forward in this way, the period preceding death may be rendered relatively painless, and the practitioner secure in the consciousness that he has exhausted the resources of his art, will have placed himself beyond the haunting sense of duty unfulfilled.

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29 Fifth Avenue.

Physiological Iodine*

Iodine as an Essential Element in the Animal Organism: Its Influence on Normal Metabolism: Its Relation to Glandular Activity, Control of Blood Pressure and Senility

By A. JUDSON QUIMBY, M.D.
New York.

Iodine is one of the elements, widely distributed in nature and usually found in the form of salts or organic combination. It is one of the halogen group. It is univalent, with a molecular weight of 125.9. Its principal source is from the mother liquor of Chilian saltpetre, and the ashes of seaweed, these ashes being known as kelp. "Kelp is the ash left on the burning of seaweed" (1). Iodine is found in practically all sea foods and plants, it is also found free in sea water. It is found in the air in organic form, which may explain some of the invigorating properties of sea air. It is widely distributed in the soils, but the extreme solubility of its salts tend to reduce rapidly its proportion in the land.

The iodine preparations for internal administration consists of the soluble salts and the tincture of iodine, although the latter is popularly known as an external counterirritant and antiseptic.

The iodides, usually in the form of potassium iodide, have been rendered famous in the treatment of syphilis and its complications. At this point I wish to dismiss the subject of syphilis, forgetting that the disease exists, or that the iodides were ever used in its treatment. By so doing, a better conception of the essential physiological action of iodine and its influence upon the body metabolism and resistance to disease processes can be conveyed.

Early in my career as a student the opportunity was given me to interest myself in chemistry, and especially pharmaceutical and physiological chemistry. Therefore, when the time came in my life when I wakened to the fact that I was living a simple animal existence, without due consideration to some of the results of civilization's deteriorating influence, I was inspired to search into and experiment upon myself in such a way as to combat some of the evil results of artificial feeding and confinement in our modern homes.

Having picked up considerable information with regard to the physiological action of the various elements, I recalled that there was a constant tendency in our literature to dwell upon the efficiency of the iodides in modifying the effect of arteriosclerosis, and that it was common procedure to give the iodides in arteriosclerosis. Also, I recalled that peoples who lived along the coast and indulged freely in sea food were immune to certain diseases, and were an unusually rugged type. A physician recently informed me that he had made inquiries among seafaring men, and had found that arteriosclerosis, apoplexy and high blood pressure were very rare, and he thought perhaps the explanation of this lay in the constant absorption of minute quantities of iodine. In addition, I knew that a great many of the old time so-called spring tonics, which were so successfully prescribed by the old practitioners, contained small quantities of potassium iodide. Also, as you probably all recall, it has been mentioned that possibly one of the reasons for the efficiency of codliver oil as a tonic and as a restorative and alterative, is that it contains traces of iodine compounds. All these points led me to think that it was not merely the quantity of iodine administered that accomplished results, but that it was a small amount given over prolonged periods that resulted in the greatest accomplishment of good. Therefore, I set myself to administer it in some form in small quantities. Knowing the sensitiveness that arises within a person to whom the use of the iodides is suggested, and also the question that would naturally come should one be accused of taking the iodides, I recalled that the tincture was a favorite method of administering iodine in small quantities, and adopted the tincture as a medium for taking iodine.

After having practised on myself for two or three years with this, and having acquired some general practice, I began to experiment in a small way with several patients who exhibited signs of vascular changes and also kept in mind the tonic properties of iodine in the management of cases needing tonic treatment. It has now been sixteen years since I first administered it with the same object. During that time I have accumulated an experience, both personal and general, which has convinced me that iodine is the most vital and efficacious element in the organism, and also that it is the element most frequently lacking in its physiological quantities.

Later in my personal experience, and especially that of röntgenology, my work exposed me to an uncommon degree to the effects of the x ray, the character of my work involving a vast amount of fluoroscopic examinations. At present, after nineteen years of x ray work, I regard myself as being in fully as good physical condition, or even better, than I was ten to fifteen years ago. The great credit of this I attribute to the consistent use of iodine. The x ray might be likened to that destructive flame of life referred to in Rider Haggard's *She*, precipitating a premature ageing of the organism. I regard iodine as the greatest inhibiting agent of those things which contribute to the end result, called senility. Therefore, I give practically all the credit for my present condition to the fact that I have maintained my iodine content through my röntgenological career.

Practically all the writers look upon iodine as an excitant or stimulant to the person receiving it, and therefore to be administered with conservatism for fear of the results usually found in the use of stimulating agents.

The experience and observations of Paul Bourcet are the most illuminating of any writer from whom we were able to quote. In 1899-1900 in a thesis read before the French Academy of Medicine, he gave a very thorough analysis of iodine and its action, as observed by himself and others. In conclusion Bourcet states that he believes that iodine comes externally, all the elements around us contain iodine, sea, earth and air, and all our food, and therefore, every day we get a certain quantity. He believes that iodine exists elsewhere than in the thyroid and parathyroids, but in minute quantities. When one part of the system contains too much iodine, he believes it is passed off. He believes iodine acts as a leavening agent, having antiseptic qualities.

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*Read before the Benjamin Rush Medical Society, April 1, 1922. Read in part before the Section in Ophthalmology, New York Academy of Medicine, October 16, 1922, in the discussion of Dr. G. H. Bell's paper, The Reform Diet as a Therapeutic Measure in Ophthalmic practice.

Quoting from Maurice Lossedat, where he refers to Lortat-Jacob: "Iodine merits being considered as the specific medication of the lymphoid tissues, of which it arouses and increases the activities." Again quoting Lossedat: "The remarkable properties of iodine make it a precious medication, one of the most important of our therapeutic arsenal, one whose applications tend to become more and more enlarged."

One of the most complete books on the thyroid and thymus that has ever been published has been written by Crotti. His analyses of the experimental work of the various writers is very complete, but his views are conservative, and he does not give much credit to the theory that iodine is vital in metabolism, and especially he is conservative in his views as to its value in the general welfare of thyroid cases. But his conception is that generally held by the surgeon, except among those who are exceedingly liberal.

I think the general attitude towards the thyroid and the iodine content has been influenced very much by the various chemical analyses that have been undertaken to determine the contents of the average thyroid. This can be a great source of error, and the proof of it is in the fact that the thyroid gland varies as to the place of residence, the mode of living, or the disease processes that may be taking place within the individual, and the prolongation of shock preceding death.

Postmortem specimens are usually taken from subjects who have died at the termination of an illness, or some active disease process, or after having been subjected to stress and strain. In any of these conditions the iodine content of the thyroid gland is used up, and if the antemortem strain has been prolonged, would naturally be very low in the element iodine.

I think we must realize that the water supply and food intake of the individual is a factor in determining the amount of iodine found in the organism, and especially in the thyroid gland. A great amount of literature has been written recently pertaining to this phase. When we speak of the mode of living of the individual and its influence upon the iodine content of the thyroid gland, we must consider the activities of the person, as to whether they live in such a way as to use up their iodine content. It is my belief that our iodine content is constantly varying, its contents being subject to, first, the amount that we receive, and second, the amount that we excrete. The amount that we receive is determined by the character of our food and the manner of its digestion and assimilation, and the amount that we excrete being determined by the strenuousity of our lives, and the influence upon our body metabolism, whether they be infections or dissipations. The amount of iodine received in the organism is determined by locality and diet. Locality varies the amount of iodine in the soil, from which we receive our water, fruit and vegetables. The iodine content of water has been proved in analyses to be very variable. It has been suggested with excellent foundation that the value of mineral springs may be determined by the minute quantities of iodine present. This has been referred to in a recent article by Emery Hayhurst (2). The résumé in this article of this phase is complete.

In thinking of the iodine represented in food, I think we can vastly increase the list of fruit and vegetables which are supposed to contain traces of iodine, and I think the value of fruit in this particular has been ignored, especially some varieties. As I recall, the pharmacopœia speaks of the values of certain roots and other iodine containers, and one of these is sarsaparilla, which is supposed to have a relatively large per cent. of iodine, and is listed among the alteratives.

The article by Hayhurst mentioned above suggests that our iodine supply be furnished with our salt, but I question this method of procedure in regulating iodine supply, except after determination of the individual's appetite for salt. If we attempt to furnish the essential iodine through the table salt supply, as suggested by him, an excess may be furnished one individual, and another may not obtain sufficient for his needs. I can cite cases in which the patients had an exaggerated appetite for salt; these cases can only be determined by appropriate tests. My reason for making this statement is that I believe that our demands for iodine are determined in a great measure by our activities. The greater the quantity of iodine consumed by increased functional activities, the greater the proportion of iodine needed. The indications for iodine have almost a constant similarity with those observed as indications of overstress and strain, among which can be mentioned exhaustion, the overtraining or going stale, as the expression is, of the athlete, and the manifestations of hypertension, which we see in the strenuous type of individual. I would here suggest that it is possible when the athlete, the prize fighter or some one subject to intensive physical training goes stale, he has used up this iodine content, is calling upon his reserve, and is not assimilating the proper amount.

My reason for this is in a measure due to some personal experiences. I have observed that when in great strain, and prolonged physical and mental effort, if a small quantity of iodine is taken, the sense of relief is immediate, and distress relieved very promptly; and if taken at bedtime the sense of well being and restored vitality is present the following day. Also, if after a prolonged period of work, extending over two or three months, the individual has reached the stage where the need of relaxation and rest is very vital, he is supplied with small quantities of iodine, the restoration to a sense of restored efficiency and power to carry on work is very rapid. Among the consequences the increase in years brings to all of us, we find changes in blood pressure. We see that there is generally a tendency for an increase, occasionally the socalled esthenic type will be found to decrease. In the majority of cases with which I have come in contact, there has been increase in pressure, with all the systemic complications that will arise from an arterial heart and kidney distress. Although my practice has not permitted me the observation of a large number of cases, I cannot recall one single instance of high pressure that was not reduced when the iodine was properly administered in an amount suitable to meet his physical needs, and this was without regard to any regulation of diet, or rest in bed, the usual manner of handling these cases. Perhaps my good fortune has kept me clear of cases with extensive complications such as advanced renal changes. The physiological action of iodine has never been fully determined, all writers declaring that no method so far presented can solve this question. Numerous theories have been proposed, the one of Bourcet, that it is a leavening agent, approaching nearest to an explanation of the needs of its presence.

Two additional theories to explain the lack of iodine may here be proposed: Firstly, the food absorbed may be low in iodine content, but in addition the capacity of the individual's digestive system to admit the absorption of the existing iodine in the food may be reduced by the putrefactive changes in his system, which render the chemical constituents nonabsorbable.

Secondly, the number of functionating thyroid cells may be reduced by sclerotic changes subsequent to disease, or the absence of the proper amount of iodine with which to function, and the remaining cells being called upon to absorb iodine from the blood stream must have a higher percentage of iodine within the organism from which to abstract the necessary amount. That is, if the blood supply through the thyroid gland does not have an increased proportion of iodine dissolved in it, the remaining functionating thyroid cells are unable to abstract it.

Until the chemical problems in this matter are solved, we must accept the clinical experience, which is our best criterion, and give consideration to the things which occur within the patient to whom iodine is administered.

The first subjective symptoms that the individual has, following iodine administration, when there is a need for this element, is a sense of well being and of comfort, with a tendency to increase in exuberance of spirit and ambitions. The respiratory action is more active, and sensations somewhat similar to those experienced when oxygen or ozone is inhaled, occur. This is so characteristic that I have frequently heard it so expressed by patients, and have experienced it myself.

The second effect is that of an increase in the cutaneous circulation, most manifest in the patient who has a cold skin, whether dry or moist. If the hands and feet are cold, the circulation is increased, the willingness to do work and the ability to accomplish results is more manifest. If, in the lag and exhaustion that follows an unusually driving period of work, a few drops of tincture of iodine are administered for several days, the effect is almost equal to a weekend rest in restoring the mental and physical activities. Of course, at this point we may well mention that such restoration cannot harden the muscles and restore physical strength to the degree that proper exercise will produce, the greatest benefit being derived from the combination of both iodine administration and reasonable exercise.

How many of us have seen the exhausted business man attempt to reinvigorate himself in a short period of rest and strenuous athletics to which he is not accustomed? We frequently see these men almost as haggard at the end of .ten days' vacation as at the end of a winter's hard work. This can be greatly changed if suitable measures accompany the vacation periods. Often the mere exertion incidental to vigorous exercise may exhaust the organism by depriving it of the essential restorative agent, "iodine."

Third, the results attained from the administration of thyroid extract can so thoroughly prove iodine to be essential to the animal organism, if we give credit to the iodine content of the thyroid gland.

Fourth, the effect of iodine administration upon the circulatory system and its associated organs can be accepted as evidence that iodine plays a very prominent part in the distribution of the blood supply. We have noted that it increases the skin circulation, that it increases glandular activity, that various functions are activated, Bourcet referring to its diuretic properties. It also increases the secretion of bile.

Fifth, the general effect of iodine on the organism in relation to ageing, which, as we must recognize, begins the day we are born with the deposit of connective tissue, and general sclerotic changes which end in the socalled senile state. As mentioned heretofore, the x ray evidently hastens all these processes, and I wish here to lay emphasis upon the importance of considering the proper amount of iodine as the most vital element in combating senile changes incidental to our growth, and those constitutional disturbances that accompany the life of the active röntgenologist.

All this being so, we can draw some conclusions as to the function of iodine in the animal economy. I will go one step farther than Bourcet, who describes it as a leavening agent, and say that it is the activating or underground wire, which regulates the capillary circulation throughout the organism, and lack of this agent simply means that the capillaries contract, and do not permit active circulation in the part that they should supply with a swiftly flowing blood stream. Contraction of the arterioles evidently occurs throughout the organism, in all parts where they can be spared to the best advantage, leaving the rest of the organism to functionate more freely. This, naturally, decreases the power of the body to carry on full functional activities, and when the iodine supply is sufficiently reduced exhaustion occurs, and the organism must be put at rest until a sufficient amount of iodine is absorbed.

One of the effects of the decrease in iodine supply, and the contraction of the capillaries, is the increase in the effort of the driving forces of the circulation to propel the blood in its proper channels. This occurring rapidly, and for long periods, results in a rise in pressure, and arteriosclerosis, which is Nature's attempt to maintain a continuously contracted vascular system. Nature reinforces the walls of the bloodvessels with connective tissue till finally they become motionless, and subject to increased strain and stress. Calcification occurs, with all the accompanying senile changes. The senile depredations are general throughout the organism, the capillaries that should have been active in aiding elimination and promoting functional activities do not contract, and round cell infiltration occurs in these areas.

Also the general sclerosis that is observed in the aged, as in all degenerative changes, is retarded by rest, because while resting the circulatory system is relaxed, and the iodine reserve is being built up. Ageing can be retarded by the maintenance in the organism of an iodine supply proportionate to the needs of the individual, this I have had ample manifestations of in my rather long experience with this element.

There are various methods of administering iodine; we can use almost any salt or solution of the element. The most logical method of administration that I have so far discovered has been in the form of a tincture. The tincture is one that I have used for fifteen years, and have found it entirely satisfactory in all cases where iodine was indicated. This is a modification of our standard tincture of iodine. The formula is as follows:

Iodine crystals	gr. xxx
Ammonium iodide	gr. xx
Alcohol	oz. ss
Glycerin ad. oz. q.s.	oz. i

M.F.T. glass stopper, pipet dropper bottle S. one to four drops in a glass of water, once a day.

The alternative method of administration is to give the patient his month's supply in one week, dividing the dose into seven parts to be taken daily, diluted with water. The former method is preferable, but the individual's peculiarities in temperament must be considered in administering drugs. Very few patients need more than two drops a day, or seven drops for seven days within the month. The average person of middle age, weighing 150 pounds, requires one drop a day.

The prescription given above has been prescribed many hundreds of times by medical associates, with general approval, and has been found very satisfactory by them in its constitutional effect, and freedom from gastric disturbance.

In combating this hypoiodized state, we must get away from the common practice of attempting to saturate the patient by serially increasing the dose. Instead of increasing this dose drop by drop each day, my frequent practice has been to start on about four drops for four days, and then decrease to one or two drops as indicated by the character of the patient. This produces a prompt restoration of the essential physiological iodine, and allows a continuation of a sufficient amount to satisfy the needs of the organism.

If we would estimate the quantity of iodine taken in the human economy in a year, we would probably find it to be about one ounce of the element. By following this procedure we add from thirty to sixty grains to the yearly supply, which, for ordinary purposes, will suffice the indications of the average weight adult.[1]

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40 EAST FORTY-FIRST STREET.

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[1] This complete paper, with translations from the European writers and case reports, will be published in reprints.

Neurosyphilis and Neurotropic Strains

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Although an important achievement toward the solution of the problems regarding paresis and tabes, the demonstration of the Treponema pallidum in the brain and spinal cord has not finally elucidated the question as to the genesis of these affections. Considerable discussion has arisen concerning this phase of the subject, and a number of theories have been advanced to explain the genesis of paresis and tabes, based upon clinical, statistical, bacteriological or immunological studies. Methods have been devised for producing and studying syphilitic infection of the central nervous system in laboratory animals, with the hope that an experimental infection might be produced analogous to that in man, which would give the clue for the solution of this perplexing problem.

Marchand (1) and a few others still dispute the rôle of syphilis as the cause of paresis, believing it to be due to some unknown agent, probably a filterable virus, the spirochetes in the brain occurring as an associated or secondary infection. Klingmüller and Baermann (2), Noguchi, Hopkins, and Zinsser (3) and others have been unable to obtain filter passage from syphilitic material, and believe the assumption of a filterable stage of the syphilitic virus unjustifiable.

A number of statistical studies have been made purporting to show that neurosyphilis is a distinct disease entity, attributable to a special neurotropic strain of the treponema.

Morel-Lavelle (4), Brosius (5), Eichelberg, Burrow (6) and others have investigated groups of cases apparently having a common source of infection. These observations in some instances support and in others oppose the conception of a neurotropic strain.

Fischer (7) collected statistics covering conjugal neurosyphilis and computed the frequency with which the husbands of syphilitic wives developed paresis, comparing this with the total paretic morbidity in syphilis. Fischer found a percentage of 10.5 in conjugal paresis, which when compared to 3.7 per cent. for syphilitic men in general of the same nativity (Pick and Bandler) (8), he believed to be strong statistical evidence in favor of the existence of a neurotropic strain.

The contributions of Mattauscheck and Pilcz (9) are especially noteworthy, as the material at their command could be studied with a considerable degree of exactness. They computed the frequency with which 4,134 syphilitic officers of the Austrian Army developed paresis, tabes or cerebral syphilis. Records were accessible which contained the time of infection, course of the disease, treatment and sequela. They found that in 4.67 per cent. paresis developed and in 1.6 per cent. tabes. Other statistical studies embracing this question are those of Hannard and Gayet (10), Hauptmann (11), Meyer (12), Plaut and Goring (13), Schacherl (14), Keidel and Moore (15). The percentages reported in some instances are exceptionally high, apparently due to the inclusion of all asymptomatic cases showing any abnormality of the spinal fluid as neurosyphilis. Objection might be raised to the small number of cases studied by some of these investigators. Aebley and others believe that the paretic morbidity in syphilis is not less than ten per cent., which is in accord with that given by Fournier.

It is obvious that no final conclusions can be deducted from statistical computations embracing clinical material, although valuable when considered in connection with other investigations.

It is of interest that Plaut (16) regards the fact that familial paresis and tabes are comparatively rare, as opposed to the acceptance of a peculiar type of spirochete which invariably produces paresis or tabes. He is also of the opinion that the changes frequently found in the spinal fluid during the secondary stage of syphilis, are usually followed by normal conditions, regardless of specific treatment, and it appears unlikely that these alterations should be regarded as the foundation for the subsequent development of tabes or paresis. A similar view has been advanced by Mott.

Based upon observation in familial tabes and paresis, some clinicians are inclined to consider these affections more likely due to the action of the spirochete on tissue sensitized either by certain methods of treatment or natural family peculiarity, than to a special strain of the organism introduced at the initial infection.

It has been shown experimentally that subcurative doses of the arsphenamines frequently renders infected animals more susceptible to infection than the normal control.

Hagelstam (17), Catsaras and others believe that a congenital or acquired nervous predisposition can be discovered in every case of neurosyphilis, and Stern asserts that fifty per cent. of all his cases of tabes and paresis were of the asthenia universalis type, and thirty-five per cent. showed defective functioning of the thyroid. General paresis appeared to develop most frequently in the cases of thyroid insufficiency.

Frühwald and Zaloziecki (18) tested the spinal fluid of syphilitics by inoculating the testicles of rabbits. The results obtained by them including those previously recorded, showed positive results in primary and secondary syphilis, without nervous symptoms, in two cases after the eighth week; in the secondary stage, in seven cases, from the third to the twelfth month; but in no cases of tertiary syphilis. In the cases with objective nervous manifestations, the results were as follows: early syphilitic meningitis, once; neurorecurrence, once; apoplexy and hemiplegia, twice; syphilitic meningitis, once; spinal syphilis, ten years' duration, once; tabes, twice; paresis, five cases. In inherited syphilis immediately after birth, twice; syphilitic leptomeningitis later in life, once; and juvenile paresis, once. The frequency of positive results in secondary syphilis without nervous manifestations, is of interest.

It has been demonstrated that the Treponema pallidum may invade the central nervous system at a very early period in rabbits infected by testicular inoculations of welladapted strains.

The rôle of the spinal fluid, however, as a possible factor in the genesis of paresis and tabes, remains obscure for the present.

Promptly following the demonstration by Noguchi (19) of spirochetes in the brain of paretics after death by histopathological methods, several investigators attempted to obtain organisms by brain puncture from living paretics. Forster and Tomasczewski (20) were able to find the spirochetes in the brain material obtained by puncture in forty-four per cent. of the living cases examined, and Valente in seventy per cent.

The Treponema pallidum appears to be readily demonstrated in the brain of paretics in those cases having epileptoid seizures immediately preceding death.

Several excellent pathological studies have recently been prosecuted with reference to the location of the Treponema pallidum in the various organs of the body, and the distribution of the spirochetes and their relation to the nerve elements within the central nervous system in paresis and tabes.

Valente's (21) extensive studies embraced the spinal fluid, cerebral puncture, the Treponema pallidum, a histological examination of nervous tissue and experimental inoculations. He demonstrated the spirochete in seventy per cent. of the cases by cerebral puncture, which in some cases required a second puncture, indicating that negative results by this method are not conclusive. The cerebrospinal fluid was negative in three of the spirochete positive cases, four times doubtful and twenty-one times positive, an observation of considerable interest and importance.

Valente succeeded in staining the spirochetes from paretic brains with Giemsa's method, and was unable to discern any peculiarities in morphology or staining properties.

Histologically he found that areas relatively poor in spirochetes, often showed the greatest tissue changes, from which he deduced that the disease process does not develop uniformly in the cortex, but is disseminated from area to area. Contrary to Noguchi's description, he discovered spirochetes in the vicinity of bloodvessels and lymphatics, and occasionally in the lymphatics of pial vessels penetrating the cortex. Numerous spirochetes were frequently seen surrounding ganglion cells and lying bewteen plasma cells, but not within the cells.

Although a number of attempts were made to inoculate rabbits with spinal fluid, blood and puncture material from living paretics, his results were repeatedly negative; and in consequence is inclined to agree with Forster, Tomasczewski and others that the virulence of the spirochete from the paretic is probably reduced for rabbits. However, he believes that paresis develops as a sequela to early luetic meningitis, when the spirochetes in some manner succeed in penetrating the membrana limitans glia.

Attempts to discover the Treponema pallidum in the organs of the body other than the central nervous system in paresis and tabes, have been made previous to and since their demonstration in the brain and spinal cord, with almost uniformly negative results. Spirochetes have been found in practically every organ of the body in hereditary syphilis. Warthin (22) made routine microscopical examinations of the organs after death of persons having exhibited symptoms of syphilis, and found in the heart, aorta, kidneys, pancreas and other organs evidence of syphilitic changes.

Syphilitic aortitis is not uncommon in paresis, and Jahnel (23) has demonstrated the Treponema pallidum in the aorta in this affection. Jahnel's (24) contributions concerning the distribution of spirochetes in the nervous system in paresis are of especial interest in view of the thorough character of his studies. He found spirochetes most frequently in the cortex of the frontal region, but also in the temporal, parietal and occipital regions. Spirochetes were occasionally encountered in the white matter. The organisms were also demonstrated in the basal ganglia, pons, aqueduct, nuclei of the third nerve, and in all the cortical layers of the cerebellum. Spirochetes have been found by Igersheimer (25) in the visual tract in paresis.

The number of spirochetes found in any region of the brain may be small or great, but no definite area has been determined which invariably contains spirochetes. The demonstration of the spirochetes in the meninges of the cerebrum, cerebellum, pons, and in the walls of the basilar artery, choroid plexus and cerebellar veins, has been an important contribution to the pathology of paresis. In cerebral lues and early syphilitic meningitis spirochetes have been found in the meninges of the cerebrum and cerebellum. Noguchi (26), Richter (27), and Verse (28) discovered spirochetes in the posterior roots and dorsal column of the cord, and Jahnel in the spinal meninges of tabetics in a few instances.

These findings would indicate that the division of syphilis of the central nervous system syphilis into parenchymatous, and interstitial or meningeal as essentially artificial.

One of the most interesting neuropathological conditions encountered, are those cases which exhibit both syphilitic and paretic tissue changes in the brain. Straussler (29), Nissl (30), Jakob (31), *et al,* have made detailed studies of this character. In a case published by Nissl the patient, a syphilitic, had mental symptoms two years after infection, and seven years later following a head injury developed paretic symptoms and subsequently status epilepticus. At autopsy the histopathological findings were those of paresis combined with arteriosclerosis and various luetic changes.

Jahnel examined a case of paresis combined with gummata, and found the distribution of the spirochetes similar to that seen in uncomplicated paretic cases, but the gummata contained no organisms.

A number of cases of this type were investigated by Jakob, who advanced the opinion, previously suggested by Fischer, that the occurrence of gummata was indicative of an acute exacerbation of the disease process. On the other hand, this gummatous reaction may be conditioned by a disturbance of tissue immunity.

Ehrlich (32) advanced the theory that the long incubation period of paresis might be attributed to a highly resistant strain of the syphilitic organism, in analogy to trypanosomiasis and other spirochete diseases. These resistant generations result from the increased adaptability of some of the parasites of each generation to the immuniological reactions of the body.

This theory has been used as a working basis by some investigators in an effort to isolate a neurotropic strain of Treponema pallidum. The theory that strains exist which have a special affinity or selective action for nervous tissue, has been proposed in support of a neurotropic strain. It is stated that certain strains of Treponema pallidum show different morphological characteristics, and which will invariably produce syphilis of a definite type, a subject of considerable importance.

The observations of Noguchi (33) in his studies on rabbit syphilis are of interest in connection with this question. He distinguishes a difference in the morphology of several strains of Treponema pallidum. Some of the strains appear notably thinner than others, and this variation in morphology appears to have some distinct relationship to the degree of motility, the infectiousness and facility of cultivation. Three different forms are described. According to Noguchi the thicker forms have a longer incubation period, and produce hard, indurated sharply defined nodules. With the thinner more active types, large diffuse lesions result.

Nichols (34) inoculated the testicles of a rabbit with cerebrospinal fluid from a case of neurorecidive in the secondary stage of syphilis, with positive results. He asserted that the strain isolated in this manner resembled the thick type described by Noguchi, and believed it to be a neurotropic strain. This strain was subsequently studied by Zinsser and his coworkers, and recently utilized by Brown and Pearce in their work on experimental syphilis.

Zinsser (35) found that the Nichols strain produced practically all of the ordinary lesions in rabbits observed with five different strains obtained from other sources. He also found variations in size and thickness in all the strains studied.

The animal experiments of Steiner (37), Weygant and Jakob (38) do not favor the existence of a neurotropic strain. Their studies embracing syphilitic infection of the central nervous system in rabbits, showed that the same strain does not invariably produce lesions of a similar character, or of the nervous system.

Brown and Pearce (36) have recently confirmed these observations, and have demonstrated that the variations in the clinical course of syphilitic infections, the occurrence or nonoccurrence of generalized lesions and the character of the lesions in rabbits, is determined by modifying the reaction of the experimental animal. They noted that distinctly different types of disease could be produced by inoculations with a given strain of Treponema pallidum, and that a connection was appreciable between the experimental conditions utilized and the type of disease which resulted.

They further showed that when a high degree of protection is obtained for other tissues of the body in this manner, it is sometimes inadequate for the eyes, and lesions of the cornea and iris only occur. It would appear that all tissues are not equally protected by the general reaction following luetic infection, which they offer as a possible explanation for the genesis of neurosyphilis.

Pfeiffer (39) succeeded in obtaining strains in four cases, by inoculating the testis of rabbits with material obtained from the brains of paretics. One of these strains was continued to the seventh and the other to the ninth generation. In reference to the percentage of takes, there was a slight difference in the strains studied. The incubation periods varied from sixteen to sixty days, but averaged from nineteen to thirty-one days. The character of the lesions obtained constituted a factor of interest, in that both hard nodules and large diffuse processes were obtained. The inference seems justifiable from this work, that the thinner types of treponemata play as important a rôle in paresis as the thicker ones. There would appear likewise no reason to assume that a neurotropic strain exists, but that in paresis the different forms of the Treponema pallidum may be encountered.

Other investigators have obtained syphilitic testicular lesions in rabbits by inoculating paretic brain material, but have not succeeded in continuing the strain. Jahnel and Valente could distinguish no difference in the morphological or staining characteristics between spirochetes from paretic brains and from other sources.

Levaditi and Marie (40) have recently made some interesting experimental studies regarding neurotropic strains. They succeeded in obtaining lesions in the testicles of rabbits by inoculating with blood from a paretic. The strain was transferred to other rabbits, and designated by them as a paretic or neurotropic strain. This strain was compared with the socalled Truffi or dermatropic strain secured about ten years previously from a primary infection in man and continued in rabbits, and which had become welladapted to the rabbit.

The following chief differences are given by them. In the dermatropic strain the incubation period is about fourteen days, the primary lesion is deeply infiltrated and ulcerated with a duration of approximately three months. It can be readily transmitted to monkeys and man.

The neurotropic strain has a longer incubation period, occasionally four months. The lesions produced are superficial with slight ulceration. Duration averages about one hundred and thirty days. Attempts to inoculate monkeys and man were negative. No superinoculation was obtainable with the same strain, but the animals exhibited no cross immunity.

The length of the incubation period cannot be taken as an absolute criterion for differentiation, as the incubation period in experimental syphilis fluctuates considerably. It is more difficult and requires a longer incubation period to inoculate animals with human syphilitic material than with rabbit strains.

Neisser produced chancres and secondaries in two monkeys with material from a nonulcerated gumma and the periods of incubation were fifty-one and sixty-eight days. It is conceivable that the small spirochete content of such lesions, or the long sojourn of the spirochete in the human body has altered its infectivity for lower animals.

The statement by Levaditi and Marie that the paretic strain is not pathogenic for man, would appear to oppose the supposition of a neurotropic strain and the statistical assertions regarding marital paresis.

Levaditi and Marie have compared a strain newly isolated from a paretic with that of the old Truffi strain, which had been transmitted through rabbits for ten years, on the basis of a difference in their conduct towards man and animals. It is obvious that their basis for comparison is untenable.

Ross (41), Bayon (42), Artz and Kerl (43), Jacobsthal (44), Klarenbeek (45) and others have described a disease spontaneously occurring in rabbits, the lesions of which contain an organism indistinguishable from the Treponema pallidum of human origin, and which has been designated as spirochete cuniculi. The lesions have a predilection for the prepuce, vulva and anus; are superficial, not indurated and present a scaly, papular, slightly elevated aspect. The disease is readily transmitted to other rabbits, the incubation period averaging about seventy days. The organism is not pathogenic for monkeys or man. The striking similarity of the behavior of Levaditi and Marie's neurotropic strain to this organism, and their failure to distinguish between them, has been regarded by some investigators as evidence for their possible identity, and believe these workers were probably dealing with the rabbit disease.

Levaditi and Marie refer to the possible existence of a neurotropic strain in symbiosis with the Treponema causing the usual form of syphilis, a theory previously suggested with reference to malignant syphilis and trypanosomiasis.

The results of the work of Brown and Pearce (46) and Eberson (47) do not support the assumption of a neurotropic strain.

It is of interest from an immunological viewpoint that pregnant paretic women do not appear to abort or give birth to syphilitic children. This might be explained by the fact that few spirochetes are found in the circulating blood in paretics, or on the basis of a peculiar immunity communicated to or existing within the fetus. The presence of the parasite in the body may not at all times indicate disease but an immunological balance between the spirochete and the tissues. The cyclic reactions in syphilis tend to oppose the theory that immunity cannot exist at any stage of the infection.

It has been shown experimentally that the defensive mechanism of the pregnant rabbit reacts against inoculations made at the time of conception, in consequence of which but slight or no clinical signs of infection result.

The belief which formerly prevailed that the natives of certain countries, viz., Turkey, Bosnia, and other countries, while suffering from syphilis rarely developed paresis, and often advanced as an argument for the existence of a special paretic strain, has been recently disproved by observations made during the war, which modified customs permitting foreign physicians access to the mentally affected.

The milder form of syphilis in the natives of some countries, and the greater incidence of paresis and tabes in the white, than the negro and certain other races exhibiting more frequently extensive lesions of the skin and bones, can be adequately explained by the established facts of individual and racial immunity in general.

It is apparent that while clinical studies would seem in some instances to support the assumption of a neutropic strain, the pathological and experimental data available at present conflicts with the acceptance of this explanation for the genesis of paresis and tabes.[1]

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[1] The author's references will appear in his reprints.

The Amyostatic Syndrome:

*Lenticular, Striate or Dyskinetic Disease—New Aspects and Theories**

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The cortex constellates our volitional or dynamic motor system whose function achieves action and movement. If invalidated a train of symptoms results which we refer to as corticopyramidal spasticity with its major signs of monoplegia, hemiplegia, or paraplegia, and its minor manifestations of heightened reflexes, clonus and the Babinski, Oppenheim, and related phenomena. Contiguous to this dynamic system is that of the static, with its centre in the subcortical ganglia, presumed to function through an automatic mechanism of antagonists serving coordination, balance and postural fixation. To accomplish this an innervation and denervation interplay or coordination is necessary, that is, an automatic efferent impulse series which allows of antagonist denervation at the moment of agonist innervation. (The process when examined in detail—further on —will be found somewhat more complicated, i. e., beside the innervation factor the tension phenomenon in the muscle itself comes into play.) The regulating centre is placed in the lenticular nucleus. Strümpell (1) spoke of this latter system as the myostatic in contrast to the myodynamic of the cortex. Should something go wrong in the myostatic centre, we find that the coordination of innervation and denervation is disturbed and in consequence involuntary manifestations of trembling, shaking, rhythmic or arrhythmic movements and contractions. and rigidity appear, and because of the last, sluggish motion or few or no postural changes at all. Hence the term poverty of movement. To this triad of disturbances, tremor, rigidity, and poverty of movement, Strümpell applied the name amyostatic symptomcomplex, deeming these indications lenticular nucleus symptoms to be juxtaposed to and contradistinguished from pyramidal tract symptoms. (One therefore speaks of the extrapyramidal symptomcomplex in the literature. Other analogous terms, besides that of our title, are dyskinesia, dystonia or dystonic syndrome, paratonic symptoms, striate symptomcomplex and striate dystonia.)

Though this viewpoint may, in a general way, be accepted, subsequent research has shown that much that is complicated and insufficiently understood lies behind the conception of amyostasis as indeed in the very physiology of the subcortical ganglia, even behind the implication of the lenticular nucleus as centre of the extrapyramidal system. Just what is meant by centre—what does it do, and when diseased, what are the effects? of this presently. For the moment we may briefly say that the physiological elements which greet us are those of tonus and coordination. Out of the pathological states or elaboration of these, the clinical abnormalities ensue —namely, involuntary (uncontrollable) tremors, shaking, contractions, torsion, hypotonia or hypertonia, rigidity, slowed and delayed movements, difficulty in locomotion or in changing postures, propulsion and retropulsion, and finally, disarthric speech and possibly dysphagia. (A special and peculiar speech anomaly seen particularly in the aphasic termed palilalie in which words or phrases are explosively repeated has been described by A. Pick (2) and considered a manifestation of subcortical ganglion disturbance in which inhibition is lost. It is to be distinguished from echolalie in which the words of another person are repeated, though both conditions mostly show up together. (Aphasia, however, is very rare in the amyostatic syndrome.) (Psychomotor [katatonic] disturbances are also often due to striatum lesion in connection with frontal lobe involvement.)

The corticosubcortical interplay in the normal brain we eliminate from our discussion because of the intricacies of involvement one would encounter; yet we may remember that much that later becomes automatic and nonconsciously—i. e., subcortically—activated was originally consciously learned—i. e., cortically acquired (3). Such activities (standing and walking for instance) become wholly automatic. This means that a large number of muscles, each executing an individual maneuvre, have been trained into the most difficult and constantly changing massplay, and so well trained that their coordination may be subcortically managed. Thus the cortex is spared all details; it directs, orders and wills, while the multitudinous minutæ, in whose workings it once was also trained, are now attended to by staffs of subordinates. Yet a close interplay of voluntary action and automatism also constantly goes on. We might remember, too, that the synergism constantly entailed in voluntary activity is likewise an automatic phenomenon.

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*Lack of space makes it necessary to abbreviate much of this study; the entire will be given in the reprints of same.

When it comes to examining the mechanism of tonus in detail, we encounter more hypotheses than facts. Tonus is the tention in a muscle at ease. Even when relaxed it has a certain average cohesiveness which allows of suspension and give. As need arises in its support of altered posture or balance of limb or in the bracing of itself where weight is added, tension increases. More exactly, if we consider the complicated play of protagonists and antagonists in every action, one will say that tension increases in certain muscles while it decreases in others. There is, therefore, a continual inflow and outflow of the current achieving tonus. Whence its source? It is believed that the unceasing afferent, sensory impulses streaming in from the peripherie (muscles, joints, possibly the stretching skin), engender a latent charge in the cells of the anterior horns of the cord and also of the cerebellum, which energy is automatically fed out to the muscles as tonus current (over the extrapyramidal tract). This charge is doubtless strong, and from pathological inference, apparently deployed at maximum. Hence we assume an inhibiting mechanism which allows but a mild and graduated outflow.

Besides the tension element the muscle contains a contractile, shortening element, cortically innervated. Both tension and contractile elements are inherent in the muscle substance itself, and though separately controlled have close functioning association. Whereas the former is reflexly, unconsciously and "extrapyramidally" managed, the latter is consciously induced and via the pyramidal tracts. The former, philogenetically going back into the very beginnings of life—thus showing its greater biologic importance—is slow in its motion, exertionless, holding taut without loss of energy (4); the latter on the other hand is rapid, dynamic, expending much energy in function.

When it comes to the elaboration of movements these two elements fuse in their action so that where a contraction is purposed in a muscle group, tension automatically is lessened in the antagonists or increased when balance should be set or a posture held as an axis to pivot on. The cortex sends out the contractile impulse and reflexly the tonus lessens or augments as needs be for coordination and achievement. Not only does the supercentre inhibit the tonus current into the various muscles, but where too much is already there, must in some way arrange a backflow. Just how this is done is not clear, though a clew may possibly be found in some recent work of Economo's to which we refer below (under epidemic encephalitis). In pathological conditions, where the lenticular nucleus is invalidated, we find the inhibiting breaks do not work and the muscles are suffused with tension. This may reach such an excess that despite the cortex's willing, the tension resistance is too great to permit of rapid movement or indeed of any movement at all—in other words, we have sluggish, belated movements, rigidity or pseudocontractures.

Still other abnormalities may be encountered. Where the automatic regulator is out of order, the parts themselves may not function in proper sequence or concurrence. The action is willed, but, as a result of derangement, the antagonists are not slackened at the moment of need, or possibly they contract, or the tonus is not lax when it should be, or vice versa—and in consequence we get athetotic, shaking or choreic movements.

Yet another factor, however, is also at play. Lewy (5) (6), studying the muscles with the string galvanometer, recorded the myoelectric discharge of both protagonist and antagonist (on a drum). Another recent electromyographic tonus study is that of Weigeldt (7) who found that the tonus was controllable from the subcortical ganglia, cerebellum, spinal cord and possibly from the muscle itself. It was shown (a fact Sherrington already noted, i. e., his "successive induction") that the antagonists are not shunted out of activity when protagonists are shunted in. A contractile innervation is sent into both protagonist and antagonist but that to the latter follows an appreciable length of time after the protagonist impulse. Thus after a movement has been initiated and reaches its height, the limb does not remain stationary in space nor fall back to gravity like a dead weight: at the moment of the comeback when the protagonist impulse is spent the antagonists have the matter well in hand and the limb is carried back into equilibrium with proper support.

Should the coordination mechanism be badly damaged or helpless, cortical impulses if strong and numerous may bring on a veritable *chaos musculaire* (Babinski). Occasionally the pathological tonus element is entirely lacking, occasionally the incoordination element. The disturbances come upon may be general (bilateral), unilateral, or—very unusually—localized in one limb (8) or in a group of muscles (i. e., torticollis: cf. below on torsionspasm), possibly even in individual muscles.[1] In the syndrome in question, pyramidal tract signs are usually entirely absent, but they may occasionally be intimated (9) or even outspokenly present (Babinski, clonus, etc.) as in several cases in the literature (cf. especially under epidemic encephalitis). These facts must be remembered, otherwise the belief that the pathological pictures are clear cut and definite may mislead one.

Recent consensus of research makes it very probable that caudate nucleus and putamen constitute one functioning entity, and are best designated (following C. and O. Vogt) the striatum. The globus pallidus is a centre by itself and best designated the pallidum (10). The striatum is a gray mass closely related to the cortex, and contains large and small cells. The pallidum is a more subordinated centre containing only large cells. Philogenetically the former is recent, the latter of far earlier development. Our knowledge of the physiology of these gray masses is still decidedly meagre. From clinicopathological observation we might ascribe the function of extrapyramidal system centre or supercentre to the striatum. Yet the matter is neither definite nor clear as the discrepancies met with in our subsequent discussion will show. In an exceptionally interesting publication, from which we shall cite at length below, Lewy (11) advances the opinion that the various clinical pictures are not due to definite focal lesions but to combinations of lesions. What is certain is that the pathological process in most of the lenticular involvements goes well beyond the striapallidum itself. Concomitant liver and spleen affection, pigment deposit, sympathetic implication should be remembered. The injection of focal hystochemical or secretory (ferments, enzymes) elements into the problem is also of stimulating moment.

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[1] A postencephalitic isolated facial spasm (deemed of striate origin) was reported by Adler (Klin. Woch., May 13, 1922). One is also reminded of isolated spasm of the diaphragm (hiccough) in encephalitis.

The *amyostatic syndrome* is seen in a whole series of conditions the most important of which are paralysis agitans, the pseudosclerosis of Westphal-Strümpell, Wilson's disease, and epidemic encephalitis. A completer list (12) would embrace Huntington's chorea, dystonia musculorum deformans, spastic pseudobulbar paralysis with contractures and choreo-athetoid movements of Oppenheim and Vogt and Freund and Vogt, and progressive athetosis. Spiller himself adds Bechterew's hemitonia apoplectica and certain forms of carbon monoxide poisoning, and mentions Pelissier and Borel reporting a type they regard as a unilateral lenticular degeneration (Spiller reporting a somewhat similar case). (A. Boettiger seems to have pointed out relationship between Bechterew's hemitonia and Wilson's disease in 1912, having seen fifteen cases. He again reports on the subject in Nonne's Festschrift, having now seen thirty cases [Uber extrakapsuläre Hemiplegien, insbesondere über "Hemihypertonia apoplectica," D. Z. f. N. 68-69, 1921, p. 165]. The lesion here is an apoplexy or acute process in the lenticular nucleus and thalamus of one side.) In still a later paper (13) Spiller adds "a certain form of paramyoclonus multiplex resulting from lethargic encephalitis" also Foerster's arteriosclerotic muscular rigidity and certain forms of senile dementia which Strümpell thought belonged to his syndrome. Stertz (14), in his very thorough monograph, also supplies a list which adds nothing, however, in addition to the above save, possibly, manganese poisoning. In a recent interesting paper Cassirer (15) published two cases of torticollis which he subsumes a form of torsion spasm (dystonia musculorum deformans). He places these cases into the group of striate dystonias, and brings up the important question whether all torticollis is not of striate origin (though he believes it too early as yet to answer the question). I should like to point to still another condition, which might possibly be arrayed here, namely that of certain forms of melancholia which resemble paralysis agitans to such a degree that the clinical differentiation is very difficult. I cite such a case below. The condition found after nonlethal hanging is also mentioned somewhere in the literature. Cf. also on decapitation rigor. (Cf. Sherrington, also more recently J. Lhermitte, Ann. de méd. 10:228, 1921.) Finally it seems probable that certain forms of "stuttering" may be due to striopaliadal dysfunction. This question has presented itself not only in ordinary chronic stuttering but in forms seen in socalled "shellshock" cases.

ETIOLOGY.

From the etiological viewpoint a number of factors seem able to bring on the amyostatic syndrome. A tumor in the ganglion region has been mentioned as in a case of Oppenheim and Vogt (or a tubercle), also arteriosclerosis, hemorrhage and softening in the brain stem, tegmentum, lenticular and red nuclei and also in Monakow's tract. The (hemorrhagic) process may even come on gradually without evidence of apoplectic insult (Stertz). (It has been pointed out (Boettiger) that most of the *hemitonia apoplectica* cases also occur without unconscious attack. In Bechterew's third case (16), however, the condition was first noticed directly the child came to after several days of coma following insolation.. In Bechterew's first two cases the condition appeared gradually one to two months after acute illness (typhoid, severe "cold" with temperature.) Now and then multiple sclerosis in this area, as also paresis, will occasion parkinsonism or a choreic picture. Lues cerebri will at times produce a syndrome closely simulating Wilson's disease (as in a case of Anton and Westphal). Primary encephalitis (Strümpell's) and especially epidemic encephalitis augment the list of factors. Again abiotrophy, in Gower's sense, may be the only plausible deduction. Hall (l. c.), in fact, believes these striate cases exquisitely hereditary and abiotrophic.

Another circumstance which may occasion a kind of predilection for disease in this area is the fact that the arteries here are end arteries without anastomoses. It is logical enough that toxins (exogenous or endogenous) carried in the circulation might stagnate here and register a kind of cumulative effect.

When it comes to the actual *pathological findings* and we inquire just what process or which location gives us now this clinical picture, now that—for one must admit despite the similarities there are, withal decided differences—we get an abundance of data that are difficult indeed to assort and make comprehensive. Spielmeyer, Strümpell, Mass, Thomalla, etc., found the pathological changes of pseudosclerosis and Wilson's disease is no wise dissimilar. Stertz accepts this opinion and A. Jacob (17) comes to the same conclusion, or, at least states that as yet we do not know the histological demarcation line between the two. Wilson, himself, and Oppenheim and many others believed that both were similar while a growing group of modern writers, including Fr. Kraus out of whose master clinic such stimulating work on this and allied subjects is appearing at the moment (studies of Lewy, Dressel, etc.), proclaim both diseases identical (18).

Wilson (19) described the process as a bilateral, symmetrical, lenticular glia overgrowth, later disintegrating. The glia nuclei increase excessively while original nerve cells disappear. The vessels remain healthy. Putamen was especially involved, in lesser degree the globus pallidus, and occasionally the outer capsule. The caudate nucleus was usually atrophic but not disintegrated. In several cases the process went some beyond the lenticular area. Wilson did not find the cortex involved—later authors, however, did. The liver was always diseased.

In approaching the subject of *paralysis agitans* let me summarize the really important recent publication of Lewy's (20) in which he reiterates the opinion offered by him at Bleslau in 1913 (21) that the lesion responsible for this disease is not confined to the lenticular nucleus, and here adds excellent pathological material and observations based upon its study to clinch his conclusions.

Examined with high power, the cells of the putamen in the first specimen (P. A.) show a nearly normal structure (with its rather numerous, small, somewhat atrophic cells, and scarcer giant cells), while in the pallidum an extreme paucity of cells is noticeable. In the Huntington's chorea specimen the form of the large cells is not materially changed, that of the small cells, however, decidedly, these also being less numerous, and having close glia masses between them. Hence, he writes, one might be inclined with Hunt and the Vogts to consider chronic chorea a disease of the putamen, especially of the small cells, and paralysis agitans a disease of the pallidum cells. But such a surmise would be overhasty, for a specimen examined from still another case of chronic chorea shows that not only have the smaller cells of the putamen almost wholly disappeared, but that the pallidum with its ganglion elements is likewise most severely involved—without it having been found *in vivo* that the typical picture of hypotonic chorea was in any way modified by elements of hypertonia or rigidity.

Scrutinizing the striatum of this specimen with high power, Lewy concludes that in chronic chorea the small and smallest cells are particularly damaged by the as yet unknown noxus causing this disease (as the Vogts also assume) and that the cells of the cortex, especially in the region of the fourth layer, show similar changes—the small and smallest cells being involved. Glia proliferates where the cells have disappeared. But however important the process in the striatum is for the clinical picture, it is only part of the disease complex, for the changes in the pallidum are also severe and he believes, primary. And besides these localities other parts of the nervous system also show pathological involvement.

Studying the pallidum in the same way—thus taking up paralysis agitans more carefully—the ganglion cells are found greatly swollen and altered. Five types of degeneration can be made out. Many transition forms are seen, but where one type predominates this form of degeneration is found in other involved areas of the nervous system, especially in the cortex. And this cortical involvement is important and must be borne in mind. In fact, Lewy states that the psychic abnormalities are far more numerous in these cases than is usually presumed. Histologically the frontal and temporal lobes may show great changes, so intense at times that the frontopontine, less often the temperopontine, tracts, become almost unstainable. It may be bad enough occasionally to amount to a real (Pick's) lobar atrophy. When this involves the temporal lobe, in the righthanded, aphasia is associated. But other parts of the nervous system are also and regularly affected in paralysis agitans, namely the cerebellar cortex and, in lesser measure, the dentate nucleus.

Characteristic of paralysis agitans is also the more or less regular involvement of a nucleus system which Lewy groups with the vegetative, especially the nucleus periventric, of the hypothalamus and the socalled dorsal vagus nucleus (the autonomic vagus), finally, also the nucleus of the tuber cinerium, that of the body of Luys, of the substantia nigra, and of the sympathetic occulomotor and trigeminus.

Without question many of the changes found, both in their local predilection as in general, are dependent on vascular lesions. These, however, are not of arteriosclerotic type but must be deemed rather of simple senile trophic nature. In other words, according to Lewy, paralysis agitans is a decidedly senile or presenile process. (That an arteriosclerosis may rarely be etiologically responsible for paralysis agitans is conceivable; more probable is the fact that the same etiology may be responsible for both arteriosclerosis and paralysis agitans should they occur conjointly in an individual. Martini and Isserlin (22) publish a case in which Parkinsonism, tetanic and cerebral arteriosclerosis (severest in the lenticular nucleus) obtained.

This study, better than any I know, brings out the intricacies of precise ganglia localization of amyostatic symptoms and striopalidal disease. Combinations of areas are implicated, and one can only say, to follow Lewy's conclusions, that as far as paralysis agitans and chronic chorea are concerned, paleostriatum (i. e., pallidum) is especially and intensely affected in the former together with frontal lobes, cerebellum and vegetative system, while the neostriatum (i. e., putamen) is especially involved in the latter. Again, in the former a senile arterial change is accountable, in the latter an unknown noxus with an affinity for the small cells of the basal ganglia and the cortex. But this does not mean that senility is the cause of Parkinson's disease or that the latter is synonymous with senility (seniles usually not having the symptoms of paralysis agitans nor the latter always showing organic senility of mental changes). Nor does this answer the question of etiology. An internal secretory dystrophy—thyroid and epithelial glands—has been thought by some to lie in the background. Of moment is the finding of liver insufficiency mentioned just below.

Interesting in connection with paralysis agitans is also the work of Dresel and Lewy (23), out of Kraus's clinic in which Widal's liver function test (crise hémoclasique) was tried on amyostatic cases showing no hepatic disturbance by other known methods. In a series of thirteen such cases of paralysis agitans the Widal test was positive. Kraus spoke of the positive Widal as a vagus shock. In connection with Lewy's demonstration of a constant involvement of the vegetative nuclei in the brain stem, these authors point to the possibility of a continuing noxious action on the liver cells through vagus working substances of the nature of *Histamins* and *Histidins.*

As to other *localizing* researches we may briefly refer to Hunt's earlier studies (24) in which he concludes that paralysis agitans is due to atrophic disturbances in the large motor cells of the corpus striatum, Huntington's chorea to destruction of the small cells, and Wilson's disease to a combined destruction of cells in the two systems. (But cf. Lewy, above; also Jacob, who believed parenchymatous changes in paralysis agitans involved both large and small cells, and Economo, below.)

Much interest was shown in the necropsy findings of a case of torsionspasm published by Thomalla (25) in which the pathological changes showed great resemblance to that of typical Wilson's disease. Here, beside the lenticular lesion, a chirrotic liver was also present. In still another torsionspasm case, that of Wimmer and Neel, a quite similar pathological picture was found. These cases definitely link up torsionspasm with Wilson's disease and pseudosclerosis. In Cassire's second case, however (cf. 15), which clinically surely belongs to torsionspasm, the findings were decidedly different. There a remarkable condition of generalized brain swelling was come upon. This was severe in the striatum, yet not severer it seemed than the same condition in the cortex. Subacute destruction of cells and fatty degeneration was seen in striatum, thalamus, caudatum, putamen and cortex—most severe in the striatum. Many of the ganglion cells, especially the larger, showed glia sattelites (neuronophagie). In this case there was no diseased liver and no corneal or other pigment deposits. This case besides showing a pathological variance from Thomalla's, brings out, in conjunction with Cassire's first case (as Cassire, himself, comments), the importance of recognizing a pathological foundation for torticollis, a condition up to now so persistently deemed functional. (In New York these cases have long since been persistently *psychoanalyzed!*) That some hysterical forms may be decided similar Cassire also brings out.

EPIDEMIC ENCEPHALITIS.

In epidemic encephalitis, the disturbance come upon in the motor system, when such is present, is of the amyostatic type. Indeed the *amyostatic syndrome* has just now come into the focus point of renewed interest because of the widespread, almost epidemic, prevalence of such cases. Not that all lethargic encephalitis develops this symptom complex; yet it is frequently encountered. As we have elsewhere mentioned, it is an interesting fact that certain forms of encephalitis are seen in one locality, other forms in another, or again, that one form may give place to another, or a "mixture" of various forms obtain. Thus Hoestermann (26) at the Magdaburg Hospital mentions cases in which tremor, athetosis and chorea were seen in the same patient at the same time or in sequence. *Yet not a single case of the amyostatic type occurred*—while this last form was especially prevalent in Hamburg. Netter in France believed that at least fifty per cent. of the nonlethal cases developed this syndrome. More recently J. A. Sicard (27) placed the proportion at one third.

Clinically, the picture here is briefly described by Nonne (28) who writes: "The limbs are held flexed and adducted and in fixed attitudes suggesting contractures. There is no active motion, because there is no movement—or action—impellance. When passively moved, the limb remains 'as put,' or, if lifted, but slowly comes down through gravity. In order to accomplish a change in position or an unflexing of a limb, resistance is encountered, and must be overcome. It is in this that the strange portural tonicity differs from *flexibilitas cerea.* Westphal spoke of the matter as fixation rigity, a phenomenon by many thought responsible for the Parkinson's mask or fixed mimik, so frequently seen in the disease. As my experience grew with these cases I became aware that the hypertension I expected to find on moving the patient's limbs was not there. It seemed as if the phenomenon was due to lack of mental steam in the patient. But the patient, however, felt a tension, and had to spur and exert himself to get his muscles to respond. Cf. case below. The strange facies, however, are also partly occasioned by the puffy, glossy, greasy skin (due to a secretory disturbance) which led one writer to allude to such countenances as "salve faces."

The encephalitis cases showing the amyostatic syndrome have been grouped under the caption of Parkinson's type. The condition itself is referred to as parkinsonism, or better, acute parkinsonism. Besides the peculiar tonusphenomenon (dystonia) other motility abnormalities are also encountered, that of tremor being most constant. This is the same pronation—supination or pill rolling tremor seen in Parkinson's disease. But there are cases in which the tremor is by no means similar to that typical of Parkinson's, and many cases in which there is no tremor at all (*sive agitatione*). A nodding or bobbing of the head may also be noticed. On the other hand, irritation phenomena are often seen which are ordinarily missed in paralysis agitans, namely, rhythmic twitchings in the face, mouth, lips, choreic and myoclonic movements in the extremities or myoclonic twitchings in individual muscles of the extremities or trunk. Tremor of the tongue has also been noticed. These various irritation symptoms may also occur in encephalitis cases lacking the amyostatic syndrome, and when prominent are spoken of as hyperkinetic phenomena, and the encephalitis cases evidencing them as hyperkinetic form of epidemic encephalitis.

As to the pathological lesion and location accountable for this parkinsonism in epidemic encephalitis, there is as yet little conformity of opinion.

Of far greater interest are the deductions of Economo (27) presented in a discussion (paper) read at the Brownschweig meeting.

It has frequently been observed, Economo continues, that amyostatic (epidemic) encephalitis cases showing the severest parkinsonism, evidence a striking letting up of all symptoms of rigor, akinesis and effective torpor toward evening. An attack of fever may have the same allaying effects, even lasting over a period of several days. Were we merely to explain parkinsonism on the assumption of a partial or complete severing of the tracts of the striopallidal system then the episodic disappearance of symptoms on rise of temperature or at certain times of day would remain a mystery (28). It would seem as if some quite different mechanism possibly of vagatonic nature here comes into play, possibly a chemical sensitization through hormones, or rather (in pathological cases) a letting up of such sensitization. The disturbance of this vegetative synergy in the organism (presumably due to the encephalitic changes in the centre in the floor of the third ventricle accountable also for the inversion of sleep, disturbance of metabolism, glycosuria, etc.) besides the anatomic lesion in the conduction paths in the striopallidal system seems to bring about the condition of parkinsonism.

Economo's hypothesis is of much interest to us personally because of our own recently published viewpoint as to the sleep mechanism and the sleepimpellence in epidemic encephalitis (29). In our study we mentioned the possibility of thyroidsensitization—though a thyroid ebb and flow seemed insufficiently explanatory. Our conclusions were to the effect that the cortex is the melieu in which sleep is both occasioned and unfolded. Economo, on the other hand, seems to revert to the reiteration worn trail leading to a hypothetical centre in the floor of the third ventricle—*a centre which clinical study does not justify and theoretical facts, as we have endeavored to show, discredit.* It may be remembered also that Nonne (l. c.) pointed out that in the diseases most decidedly localized in the subcortical ganglia (Wilson's disease, etc.) (and above we have covered the entire amyostatic clinic) the symptom of somnolence did not occur. On the other hand, a recently autopsied case of Delater and Rouquie (30) brings added proof to our sleep hypothesis. Here deep somnolence—sleep for one week—obtained in an epidemic encephalitis patient without other symptoms referable to the nervous system below the cortex. At necropsy the brain stem and subcortical ganglia were found entirely free. The question also comes up, if the hyperkinetic manifestations are due to ganglia lesions, and lethargy also to ganglia or other subcortical centre lesion, why do the former, where present in lethargic encephalitis, usually disappear in sleep? (Nonencephalitic myoclonus also disappears during sleep.)

The amyostatic clinical pictures seen in epidemic encephalitis are chiefly, even preponderantly, those of acute parkinsonism. Here and there, however, variations bordering on Westphal-Strümpell-Wilson's syndrome occur, even with cirrhosed liver and the brown-greenish pigment corneal ring. An endocrine dysfunction may of course occur through toxic effects on the glands themselves without any postulated third ventrical centre. Endocrine dysfunction may also be indirectly inervated from the cortex (cf. 29). Bilateral athetosis has also been noted, even torsionspasm.

Förster (31) demonstrated a series of cases in Berlin, and among them one of torsion spasm presumably on the basis of (epidemic) encephalitis localized in the lenticular nucleus. This case in considerable measure cleared up, the torsionspasm almost wholly disappearing—which fact seemed to substantiate the diagnosis. Förster assumed an encephalitic vascular infiltration which later cleared. It might be interesting to point out that a number of hemitonia apoplectica cases are on record in which several attacks occurred, all clearing up—though a final attack would persist. In most of the cases hemorrhage (apoplexy) was presumed the cause—absorption, doubtless, being responsible for the clearing of symptoms. Though cases of hemitonia apoplectica due to epidemic encephalitis have not been described, it is very probable that such could be found if searched for. However, such cases must be most unusual, when we remember that the symptoms of epidemic encephalitis are nearly always bilateral. The picture come upon, therefore, would be a bilateral hermionia; or in other words an acute general extrapyramidal hypertonia without aphasia (and for the most part without tremor or cranial nerve involvement). Boettiger (l. c. p. 185) refers to such a case, rapidly fatal, and coming to autopsy (Nonne's wards). Macroscopically nothing was found save hyperemia. Microscopical examination has not yet been reported.

The acute parkinsonism may appear early or late in the disease, come on subsequently as a sequella or even months after with a quite symptom-free interval. The syndrome may also occur in children, though this is infrequent. Chronic (nonencephalitic) paralysis agitans is likewise rare in childhood, so much so in fact that some writers have believed the cases recorded belong rather to Wilson's syndrome). The finding of a diseased liver in paralysis agitans (23) makes the association of this disease to Wilson's disease all the greater. In three such cases of Lange (32) it appeared three weeks after the encephalitis and has remained stationary now more than a year. Henceforth we may come upon cases in which it is impossible to say whether the patient has paralysis agitans as we have previously known it, or acute parkinsonism after encephalitis. Nonne somewhere mentions such an instance. A preceding grippal attack or history of such may confuse matters. The Widal liver reaction may give a clew if it is found that the acute attack versus the chronic (and older) gives a stronger reaction, v. e. more pronounced lymphocite drop (23). This matter, however, is by no means as yet certain. In some patients the condition is slight and may be called abortive or passing, at least the outspokenness of it, slight residuals remaining. In others it must be said that a paralysis agitans has acutely been established—a picture clinically not differentiable from the chronic forms heretofore seen, or, one showing beside the familiar symptoms, such unusual phenomena as ptosis, occular or facial paralysis, twitching, etc. Whether the ultimate progress as also the pathological findings will be declared identical with that of the chronic form, must for a time still remain a mooted question. Several cases have also been described in which the statotonus and inhibition were so pronounced that the condition could scarcely be distinguished from katatonia (33). (Have these last cases greater implication of the frontal lobes? cf. Kleist) (34).

Just as pyramidal symptoms and signs are very uncommon—though they occasionally do occur—in Pseudosclerosis and Wilson's disease, so it must be said that in epidemic encephalitis pyramidal manifectations are also very unusual—*though they do occur.* How interpret them? From the fact that the *signs rarely persist, or only appear for a short time,* it would seem that an edema, or infiltration, or pressure in the cranium, probably on the brain stem or in the pons, would explain them. The possibility of a direct toxic or inflammatory action on the cerebrospinal motor (pyramidal) tract cannot be excluded, possibly in or near the pons. However, no definite necropsy pathological findings of this nature have yet been reported. All in all, this pyramidal involvement must be considered unusual.

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Surgical Treatment of Chronic Sciatica*

By WILLIAM J. TAYLOR, M.D.,
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At the April meeting of the College of Physicians in 1913, Morris J. Lewis and I (1) presented a paper on the treatment of chronic sciatica, which was based upon papers by Dr. J. Crawford Renton (2) which have received astonishingly little attention. Since Renton's original paper reporting thirty-two cases, and our own paper reporting two cases, J. Mills Renton (3), of Glasgow, has reported ten cases and A. Pers (4), of Copenhagen, has reported forty-seven cases. I now wish to add eight additional cases, making in all ninety-nine cases of chronic sciatica treated by surgical operation.

At a meeting of the Interurban Orthopedic Society, in Philadelphia, on May 27, 1920, four patients who had been operated upon were present and letters read from several others. Our report was received with much interest, although the opinion was expressed by some of the members that sciatica was not an entity but merely an evidence of sacroiliac trouble.

While I agree in general with Mark Rogers in his conclusions drawn from a study of fifty cases of chronic sciatic pain, that in the vast majority of these cases the pain is due to some lesion of the spine, sacroiliac or hip joints, I believe there are a few cases in which the lesion is in or about the nerve itself. That chronic sciatic pain is not simply a neuritis but often a perineuritis, either alone or in combination with a neuritis with adhesions binding the nerve to the surrounding tissues, I think the history of the following cases will show.

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*Read at the meeting of the Philadelphia County Medical Society, April 26, 1922.

In the majority of our cases the pain has been in the left sciatic region and there has usually been found an abnormal nerve, as is laid down in the textbooks on anatomy (1). This may account for the susceptibility of the nerve to this type of inflammation.

All of our cases were examined with the greatest care by x rays and other means, and no patient subjected to operation where there was the slightest possibility that the pain could be caused by sacroiliac strain or organic disease of the spine or hip or when intrapelvic inflammation or pressure could be suspected. The question of focal infection was also eliminated. All had been under treatment by the usual methods, of rest in bed, counterirritants, salicylates, baths, baking, electricity, and other therapy, for a period of time sufficient to eliminate the probability of recovery without some more radical procedure. In every case there was exposure to extremes of heat and cold and dampness; two were chauffeurs much exposed to weather by their occupation, and in both the pain was in their left or clutch leg. There was a history of trauma in some of these but often of slight trauma. Two were women and in both the nerve pain followed exposure to changes in temperature. Five of the men were machinists or engineers and one a city fireman.

J. Ramsay Hunt was able to collect only eleven cases in which the condition of the nerve was noted postmortem, and the majority of these observations emanated from the older writers from 1798 to 1897. Of these only three received histological study. During the fifteen years just preceding the date of his paper (1908) he could find no record of any postmortem examination. The knowledge gained by the study of these few cases has been supplemented by the inspection and palpation of the nerve trunk during the operation of nerve stretching and the occasional examination of excised fragments of the sheath.

He classifies sciatica as in two forms clinically. The neurotic, a pure neuralgic form, in which pain is practically the sole symptom, and the neuritic in which other symptoms are present, indicating inflammation of the sheath and involvement of the nerve fibres. That the nerve is actually the seat of structural alterations, may be inferred from the tenderness and accompanying motor, sensory and vasomotor disturbances, usually slight in degree. It may be regarded as an interstitial neuritis or perineuritis. He records the postmortem findings in a case of true sciatica who died from a croupous pneumonia. The nerve trunk was enlarged and thickened with a deposit in the epineurium and epineural fat of a firm translucent substance of a gelatinous consistency. Histological examination of the nerve was negative.

Sciatica is pain arising from an inflammation or the effects of inflammation of the sciatic nerve, and should not be applied to the referred pain consequent upon other diseases. I believe that it is only in cases which have failed to recover under medical treatment carefully and systematically carried out, that operation should be attempted; and that not all of these cases are suitable for operation. J. Mills Renton (3) classified them into three groups or type:

1. Cases which are quite free from pain while at rest but who begin to have pain on exercise or upon assuming some special position in bed.
2. Cases in which there is a certain amount of pain when at rest, but when it becomes really intense on exercise or assuming a particular position.
3. Cases in which the pain is of an indefinite character, present at rest, off and on, and sometimes improving to a certain extent on exercise.

In the first type the inflammation of the nerve has subsided but adhesions have developed. These may be fine or fibrous and the mode of action is clear; they drag upon the nerve and produce pain. This is the type best suited for operation.

In the second type in addition to adhesions about the nerve there is actual inflammation of the nerve itself. Many of these may be cured by operation.

The pathology of the third type, however, is not clear; there can be no adhesions and an operation can offer little chance of benefit.

He operated upon six patients of type one, all of whom made complete recoveries; upon three of type two, two of whom were completely relieved, while the third patient complained of some pain and numbness in the foot for a year but eventually recovered; and upon one of type three in which he found no adhesions and the patient received no benefit.

Nine of our own patients were of type one, and except the last who has had from time to time a recurrence of pain and tenderness along the nerve, much less intense than before operation, but sufficient time has not elapsed to predict what will be the final outcome. In this instance there was a very high bifurcation of the nerve, which was not very acutely inflamed and the adhesions were fine in character but between the two branches of the nerves there was an appearance of œdematous swelling, and in one case a fireman who had pain persistently for many weeks after operation but who eventually recovered and has been well for over seven years. I should place him in type two with a neuritis as well as a perineuritis.

OPERATION.

My rule is to make a free incision from the gluteal fold downward, of sufficient length to expose the nerve as far as the pain and tenderness extends on the thigh. The nerve is then hooked up with the finger and the adhesion surrounding it carefully dissected away. By this I do not mean stretching but simply lift the nerve up and take great care not to stretch it. All adhesions are then dissected off clean with a knife or scissors, if they are very firm, but they may be so fine that they can be stripped off with the fingers or bit of gauze and all loose ends and tags of adhesions must be removed. Great care must be exercised not to cut any of the branches of the nerve which is then dropped back into its bed, and the muscles adjusted into their places and the skin sutured. It has not been necessary to suture the fascia.

In our first case there was a very high bifurcation of the nerve with firm adhesions binding the two branches together and firm adhesions surrounding the nerve.

In our second case there was an anomalous branch springing from the anterior surface of the nerve and passing to the muscles on either side, which was like an inverted Y overriding the nerve. Underneath this there were dense acutely inflamed adhesions. The man had suffered much horrible pain for eighteen months on the least movement and experienced complete relief from the moment he regained consciousness from the anesthetic.

As J. Mills Renton very truly says: "The benefits from surgical treatment have not been widely recognized for two reasons: First, a lack of appreciation of the type of case suitable for operation, and second, the performance of unsatisfactory operations in the past, that of nerve stitching."

The patient is kept in bed for three weeks but no splint is used. He is then allowed to get up in a few days to walk about the wards and finally in four weeks to go home.

There was no mortality, nor have there been any complications; all made rapid and uninterrupted surgical recoveries. I believe, therefore, this method of treatment is well worthy of more extended trial in properly selected cases of chronic sciatica and that operation is free from risk to life and offers almost certain relief.

It is difficult for one to understand why no one else in this country has given this method of treatment a trial; as I have been unable to find a single recorded case.

On the other hand J. Crawford Renton and J. Mills Renton, of Scotland, and A. Pers, of Copenhagen, have operated upon eighty-nine patients with almost universal success, and with results which have been permanent for many years. These, with our series of ten cases, make a total of ninety-nine. Of our own, one patient died within a comparatively short time of an acute malady, but all the others ranging from 1912 and 1913 have remained permanently well until today, with the exception of our last one, still in bed, with a very slight nerve irritation at times but it is too soon to say if the result will be satisfactory.

Case I.—J. McG., aged fifty, chauffeur. Soon after coming to the country in 1888 he noticed that he had occasional pain in his left sciatic distribution, a severe attack of neuritis soon followed lasting over one month, and this was followed at varying intervals from more severe attacks, the last one coming on gradually in the spring of 1912 evidently, a perineuritis, as he was comfortable when lying down or standing and even comparatively so when manipulating the clutch of his automobile with his left leg, but when sitting after a day's work he had much pain. Walking for a few moments brought on severe pain, which was absent when he started to walk. Running the automobile soon became impossible and he was admitted to the Orthopedic Hospital. In nearly all of his attacks he had been under the observation of Dr. Lewis, and most of the ordinary methods of treatment were tried. There was atrophy of the limb.

Operation, July 15, 1912. Nerve exposed by usual method, an anomalous nerve was found, a very high bifurcation, in fact, two nerves instead of one. Both were red and swollen with dense adhesions binding them to the surrounding tissues and with firm adhesions between the two branches binding them together very firmly. These adhesions were dissected off with great care, the nerve freed well down into the thigh. This high bifurcation was undoubtedly a factor.

Three weeks after the operation the patient was able to walk home without pain and after a month of rest resumed his occupation as a chauffeur running an automobile daily and often all day in every kind of weather, and without any discomfort whatever up to the present time, April 26, 1922, ten years. Slight atrophy of the thigh has persisted.

Case II.—W. H., aged thirty-five, machinist. Six years before he had an operation for gallstones following typhoid fever and one year before coming to the Orthopedic Hospital he had a severe attack of phlebitis of the right leg and since then he had constant pain in his right sciatic nerve and was unable to do any work. He never used alcohol or tobacco and denied venereal disease. His occupation of machinist subjected him to great strain and great variation of temperature. He had great tenderness along the entire course of the right sciatic nerve but there was no evidence of venous thrombosis or varicositis and there was marked wasting of the right calf. He was comparatively comfortable when at rest or standing but use of the leg brought on pain.

As he made no progress toward recovery he was operated upon on January 24, 1913. The nerve was exposed from the gluteal fold for eight inches downward; it was red and swollen and there was an anomalous branch coming off from the centre of the nerve extending downward for two inches when it branched into two parts, these giving the appearance of an inverted Y, the two branches riding astride of the main nerve; there was also a branch from the inner side of the nerve extending downward. Beneath this branch of the nerve, and particularly where it bifurcated and overrode the main nerve, there were many adhesions with evidences of much former acute inflammation, binding the branch down upon the main nerve trunk. These adhesions, which were very dense, were dissected away with great care.

From the moment he recovered from the anesthetic his relief from pain, which he had had at the slightest movement of the leg for over a year, was complete, and has been permanent, as his last letter of February, 1922, shows. He resumed his occupation as a machinist in a railroad shop but now is a traveling salesman for an automobile company and drives long distances daily without the least discomfort.

Case III.—T. J. M., aged forty-three, city fireman. He has been exposed to great extremes of heat and cold in his occupation of fireman, and has had several severe accidents. He was once blown up in an explosion, and at another time fell through into a cellar and each time was laid up from the accident. For six months or more before he was first seen by us he had been under treatment for intense pain in his right sciatic nerve; was treated in the University Hospital where he was said to have an osteoarthritis of the hip, and again at the Jefferson Hospital where he was treated for four weeks or more for sciatica by means of blisters, cautery, and all sorts of internal medication but without relief.

The pain as he expressed it was "simply horrible" from which he could get no relief. This pain was constant even when quiet in bed, and at once increased on the slightest movement. Finally he was admitted to the Orthopedic Hospital where he was operated upon, October 9, 1913. The nerve was exposed. It was swollen, red with firm adhesions from the gluteal fold well down the thigh.

For several weeks after this his pain continued but in a lesser degree and gradually disappeared completely. When he attempted to walk there was slight drop foot and even now he cannot flex the foot completely, but there is not enough to cause him inconvenience or hamper him in climbing ladders and doing active work as a fireman. All these years he has continued at work with the great exposure necessary to it. He never has the slightest pain even in the coldest and wettest days either in the sciatic nerve or hip joint nor has he ever worn any form of protection. He has slight drop foot and there is some slight wasting of the right calf and thigh but the leg is perfectly strong and stable.

This case belongs to type 2, in which there was a true neuritis as well as a perineuritis, hence the persistance of pain for some weeks after operation. Trauma was undoubtedly a factor in producing his neuritis in addition to exposure.

The fact that nine years have now elapsed since the operation and that he is perfectly well today, April 18, 1922, rules out any disease of the spine, sacroiliac joints, and hip joint.

Case IV.—Mrs. E. M., aged forty-two. In September, 1912, she was perfectly well and had been working hard caring for her own home, but without any trauma or strain. She took a very hot bath and immediately had severe pain in her left sciatic nerve from the sciatic notch to the heel.

Various methods of treatment were employed without relief and she was finally admitted to the ward for nervous diseases in the Orthopedic Hospital and kept in bed from December 8, 1913, to March 2, 1914. During the time she was under observation every means was employed to arrive at a correct diagnosis and no evidence could be obtained of sacroiliac, spinal or joint inflammation.

Operation, March 2, 1914. The nerve was exposed by usual method, and found to be red, swollen and many adhesions binding it down. These were dissected off carefully. She made an excellent recovery. On December 26, 1914, she fell and struck her thigh and for a few days had some pain. Once since she had pain for a few days. April, 1922, she was perfectly well.[1]

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On Some Urinary Methods of Value

By JACOB ROSENBLOOM, M.D., Ph.D.,
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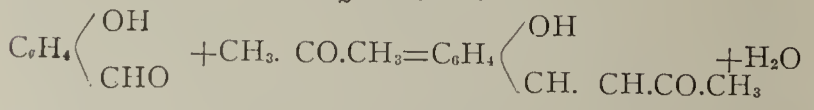
INTRODUCTION.

After considerable experience in the examination of the urine, I feel that the attention of the medical profession should be drawn to the following methods which I have found of great value in urine chemistry.

FROMMER'S TEST FOR ACETONE (1).

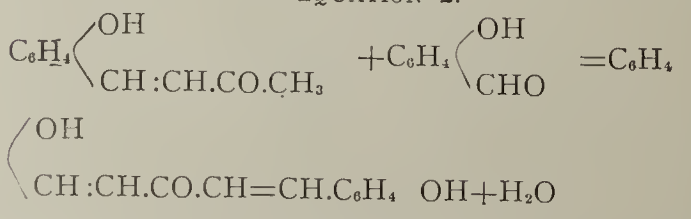
This test is based on the fact that acetone reacts with salicylaldehyde to form dioxydibenzoylacetone as the following equations show:

EQUATION 1.



$$C_6H_4\left\langle\begin{matrix}OH\\CHO\end{matrix}\right. + CH_3.\ CO.CH_3 = C_6H_4\left\langle\begin{matrix}OH\\CH.\ CH.CO.CH_3\end{matrix}\right. + H_2O$$

EQUATION 2.



$$C_6H_4\left\langle\begin{matrix}OH\\CH:CH.CO.CH_3\end{matrix}\right. + C_6H_4\left\langle\begin{matrix}OH\\CHO\end{matrix}\right. = C_6H_4\left\langle\begin{matrix}OH\\CH:CH.CO.CH=CH.C_6H_4\ OH\end{matrix}\right. + H_2O$$

This test may be applied to the urine direct and it also does not react with diacetic acid if the heating is not carried too high. The test is performed as follows: Ten c. c. of urine are rendered strongly alkaline with potassium hydroxide; ten to twelve drops of a ten per cent. solution of salicylaldehyde in absolute alcohol are added and the mixture warmed to about 70° C. In the presence of acetone, the fluid becomes yellow, then red, later purplish red, and on long standing, dark red. In the absence of acetone the color of the urine is practically unchanged.

The test may also be carried out by the following method: about ten c. c. of the urine are treated with about one gm. of sodium hydroxide in substance and without waiting for it to dissolve ten to twelve drops of the salicylaldehyde solution are added. The mixture is heated to 70° C. In the presence of acetone a marked purple red color results at the zone of contact with the alkali. Frommer asserts that this test can indicate the presence of 0.000001 gm. acetone in eight c. c. of water and I have found that the presence of protein in the urine does not interfere with this test for acetone in distinction from the tests of Lieben and of Gunning.

TESTING URINE FOR INDICAN.

The procedures for the detection of indican in the urine are based on the liberation of the acid from its base, on the oxidation of the indoxyl sulphonic acid or urinary indican into a colored product, and the solution of this substance in a suitable solvent.

It is to be remembered that if an excess of the oxidizing agent is added that the color will be destroyed and also that the tube in which the reaction is carried out must not be vigorously shaken, otherwise the chloroform becomes emulsified with the urine, from which it will separate with great difficulty, if at all.

After trying all of the various tests that have been used for the detection of indican, I have arrived at the conclusion the Jaffe's (2) test modified by Obermayer (3) with certain improvements described in this paper gives the best results. It is interesting to note that the name indican was first used by Schunck (4) to define a substance he discovered in Isatis tinctoria, which he showed was the indigo producing body of the plant. He afterward found in normal human urine indigo yielding substances, which he thought were identical with indican. This view was incorrect, however, as the two substances do not have the same chemical constitution, as indican is a glucoside and the urinary indican is not. Prout (5), however, was the first to describe the occurrence of indigo in urine. Heller (6) extracted this substance from the urine and called it "Uroxanthine." Virchow (7) confirmed the observations of Heller and showed it to be present in all concentrated urine.

This test is best carried out as follows: To nearly one half test tube full of urine add an equal bulk of concentrated hydrochloric acid containing four grams of ferric chloride to the litre. Mix by pouring from one test tube to another, not by shaking the tube, as this is apt to emulsify the urine with the chloroform. Allow to stand ten minutes and then add from three to five c. c. of chloroform. Mix again by pouring from one test tube to another and allow to stand for fifteen to thirty minutes. The supernatant fluid above the chloroform extract is now poured off and the test tube is filled with water. The marked change in the character of the chloroform extract on the addition of the water is very striking. One often finds that the chloroform extract has a dirty grayish green color, but on decanting the supernatant fluid and adding water the chloroform extract becomes a pure blue. This test as described also differs from the original Obermayer test by not using basic lead acetate to precipitate the urochrome and other substances, which promote emulsification. If the test is carried out as I have directed there is no danger of emulsification and the use of the lead acetate is then unnecessary.

I have also found that in urines that have been preserved with thymol the chloroform extract obtained in this test has a violet color, thereby interfering with the reaction (8). An apparent increase in the excretion of indican was observed by Bohland (9) when large doses of thymol were given, but as thymol appears in the urine as thymol sulphonic, thymol glycuronic, and thymol hydroquinone sulphonic acids and as a chromogen of a green pigment, Blum (10) was able to show that the color obtained by Bohland was not indican, but a derivation of thymol. The interfering action of thymol must be borne in mind especially as it is a common procedure to use this substance as a preservative for urine. The color due to thymol resembles the violet color obtained in the chloroform extract when potassium iodide is present in the urine. The violet color, due to thymol as well as the violet color due to iodide disappears on the addition of sodium hydroxide or of sodium thiosulphate.

It is to be remembered that if any protein is present in the urine, it must be removed by boiling and precipitating the protein by means of dilute acetic acid and then using the filtrate for the indican test, as protein yields a blue color with concentrated hydrochloric acid.

A TEST FOR BILE PIGMENTS IN URINE.

While a great number of tests for bile pigments in the urine have been described, I have found that few of them can be relied upon. Although Gmelin's test (11) is used almost universally in clinical laboratories, there are certain facts to be remembered before it can be properly interpreted.

This test is really not delicate enough, as it will show only about one part of bilirubin in 75,000 parts of urine, and in dark colored urine the reaction is not distinct. Urine containing an excess of indican may give a deep blue or green color; and also urine containing various drugs may give various colors. Urobilin may also react, giving blue or red colors with this reagent.

I have found that the following test (12) may be relied upon for the detection of bile pigments in the urine. The test is a modificaiton of Huppert's test (13) and will indicate one part of bilirubin in one million parts of urine. Five c. c. of acid urine (if not acid add five drops of ten per cent. hydrochloric acid solution) is added to five c. c. of ten per cent. barium chloride solution, and the mixture is then centrifuged. The barium chloride precipitates the phosphates, and bile pigments. The supernatant fluid is decanted and three c. c. of a reagent, consisting of ninety-nine c. c. of ninety-five per cent. alcohol, one c. c. of concentrated hydrochloric acid, and 0.4 gram of ferric chloride, are added to the precipitate. Heat this mixture to the boiling and in presence of bile pigments a bluish green or green solution is obtained which becomes violet or red on the addition of nitric acid.

It may be readily noted that the test is more complicated than Gmelin's and consequently requires more time, yet the results obtained by the use of this test more than compensate for this difficulty.

A TEST FOR DIACETIC ACID IN URINE.

I have been using for some time a certain technic in testing urine for diacetic acid that I think may prove of service to others. The most commonly used test is that of Gerhardt (14), but unfortunately the reaction due to the presence of diacetic acid is closely simulated by the presence of salicylates, salol, phenacetin, antipyrin, and other drugs, so it becomes necessary to distinguish the reaction due to diacetic acid from the reaction due to other substances. The methods for this purpose, based on dissolving out the diacetic acid from the urine by means of ether or by decomposition of the diacetic acid by heat, I have found are not absolutely to be relied upon.

It therefore becomes necessary to use other methods. Of course, the method of Arnold (15) modified by Lipliawsky (16) is a reliable test for diacetic acid, but it is time consuming, requires considerable care in technic, and the reagent used, paraamidoacetophenone, is very expensive, a factor of considerable importance in clinical work.

The technic used in this laboratory is as follows: Gerhardt's test is first applied to the urine in the following manner: To fifteen c. c. of urine, a ten per cent. ferric chloride solution, which must not be too acid, is added, drop by drop. The addition is continued till no further precipitate forms and then three c. c. of the ferric chloride solution is added at once. It is not necessary to filter off the precipitate of ferric phosphate produced on the first addition of the ferric chloride.

If this test is negative, that is, if a claret or port wine color does not develop on the addition of an excess of the ferric chloride, the urine is considered to be free from diacetic acid.

If the reaction is positive, the following test (17) is carried out, which allows one to determine if the reaction obtained by means of Gerhardt's test is due to diacetic acid or to the drugs present in the urine.

Ten c. c. of urine is acidulated with three drops of glacial acetic acid, and five drops of Lugol's iodine solution are then added. Shake the solution with two c. c. chloroform. If the positive Gerhardt's test was due to diacetic acid, the chloroform extract will be colorless, while if it was due to the drugs present in the urine, it takes on a rose color due to solution of the free iodine. This technic has been used by the writer for some time with increasing confidence in its accuracy and simplicity.

It must also be remembered in testing urine for diacetic acid by Gerhardt's test, that in the presence of bile pigments (18) the ferric chloride produces a green color, which hides the port wine color due to the presence of the diacetic acid. This difficulty may be obviated by heating to 70° C. thirty c. c. of urine, to which is added about two teaspoonfuls of animal charcoal. The charcoal adsorbs the pile pigments. The mixture is then filtered and the filtrate used for testing for diacetic acid with ferric chloride. I have also found that the presence of bile pigments in the urine does interfere with the test for diacetic acid by means of Lugol's solution. Therefore, in presence of bile pigments, one must test the urine for diacetic acid by means of the Arnold-Lipliawsky test as mentioned above, or use charcoal to adsorb the bile pigments and then apply the technic for the detection of the diacetic acid in the filtrate.

The following method I have found to be excellent in testing for diacetic acid in urine.

A MODIFICATION OF GERHARDT'S TEST.

The precipitate that forms with the addition of ferric chloride solution to the urine, on testing for diacetic acid, often obscures the development of the port wine color due to the presence of diacetic acid. Some have recommended that this precipitate be filtered off so as to prevent this difficulty. I have found, however, that if this test is carried out as a contact test, similar to Heller's test for protein in the urine, the precipitate does not interfere but the test is made more delicate and positive reactions are more striking. One simply pours about five c. c. of urine on top of five c. c. of ten per cent. ferric chloride solution and, if diacetic acid or the other substances that form port wine colors with ferric chloride are present, a fine port wine color appears in the zone of contact.

GUM CAMPHOR AS A PRESERVATIVE FOR URINE.

On account of the fact that urine undergoes decomposition very readily, it is customary to add some preservative to prevent such change. This is especially necessary, when one works with twenty-four hour specimens of urine, or when some time elapses between the voiding of the urine and its examination. Many substances have been used for this purpose. Chloroform acts well, but it has a strong reducing action thereby interfering with the tests for carbohydrates; it also interferes with the estimation of creatinine. It may be removed from the urine by applying heat, but this causes considerable trouble when working with many samples, and no doubt produces chemical changes in the urine, beside concentrating it. Four drops of formaldehyde solution added to five hundred c. c. of urine is an efficient preservative, but it may give rise to reactions resembling those due to carbodydrate reductions and those due to protein. It also forms a crystalline compound with urea (19), which is then present in the sediment and also interferes with the tests for bile and for indican. Jaffe (20) has shown that formaldehyde solution vitiates the results obtained in the estimation of urea, uric acid, protein, indican, bile pigments, diacetic acid, and pentose. Hausmann (21) has shown that the presence of formaldehyde solution in the urine interferes with the detection of urobilin.

Borax, boric acid, sodium or potassium fluoride, toluene, and many other substances have been advocated as useful urinary preservatives, but with little said to their advantages for that purpose.

Powdered thymol, about one gram to a twenty-four hour specimen of urine, is widely used as a preservative for urine, and until recently it was thought that this substance did not interfere with any of the tests applied to the urine. However, Welker (22) has found that urines preserved with powdered thymol yield a distillate which gives a pink or red color when Lieben's test for acetone is used. He found that this color was due to an iodothymol compound, which had previously been prepared synthetically by Messinger and Vortmann. Weinberger (23) has recently shown that a ring closely resembling the protein ring obtained in Heller's test for protein is often given by urine preserved with thymol. This ring is due to the formation of nitrosothymol and possible nitrothymol. The thymol may be removed from the urine by gently agitating equal volumes of petroleum ether and the urine for two minutes, and decanting the ether extract. The ring does not form after the thymol is extracted by this method.

I (24) have found that the presence of thymol in urine gives rise to a violet color in the chloroform extract of Obermeyer's test for indican. Hattrem and Hawk (25) found that the presence of thymol interfered with the quantitative estimation of indican by Ellinger's method. I have also noted that the urine preserved with thymol will give a positive reaction for protein when Millon's reagent is used. I have found that this reaction is due to the thymol present, and this fact must be remembered when testing urine for tyrosin by means of Millon's reagent. From these observations it may be readily noted that thymol is not the harmless urinary preservative that it was thought to be.

Powdered camphor is much superior to thymol for this purpose. About one gram for a twenty-four hour specimen is used. The excess, if desired, may be removed from the urine by filtration, and I have found that any small amount of this substance which may go into solution in the urine, does not have any appreciable influence upon the estimation of the urinary constituents and does not interfere in any way in the following tests: Obermeyer's test for indican, Frommer's test for acetone, Gerhardt and Arnold-Lipliawsky tests for diacetic acid, Gmelin's or Nakayama's tests for bile pigments.

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5070 Jenkins Arcade.

The Rôle of the Traumatic Factor in the Pathogenesis of Pericolic Bands and Membranes*

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Virchow, as early as 1853, first described the presence of adventitious bands and membranes within the abdominal cavity. More recently Jonnesco and Juvara described a parietocolic fold and Treves a bloodless fold.

Similar structures (genitomesenteric fold, attic adhesions, and others), have been described by Reid, Morris, Duval, and others, but it remained for J. N. Jackson, however, in 1909, to draw the attention of the surgeons to the pathological significance and clinical importance of certain pericolic membranes, which he described as a sort of fibrovascular film or veil, resembling closely a large thin pterygium and forming a distinct layer, easily detachable, from the subjacent peritoneum, and surrounding, like a diaphanous envelope the colon, the cecum, and less frequently the appendix also. Since that time a great many surgeons, in America as well as in Europe, have contributed to the subject, notably among the others Sir W. Arbuthnot Lane, Binnie, Martin, Mayo, Cheever, Gerster, Pringle, Coffey, Flint, Leveuf, Bainbridge, Lefebvre, Eastman, Cuneo, Pilcher, Frazier, Tosatti, Giordano, DeGaetano, and others; therefore, such a pathological entity cannot be considered any longer as a clinical rarity.

There is yet, however, some discrepancy about the origin of such membranes.

Arbuthnot Lane, Fagge, and others described them as "crystallization of lines of force" and the result of stress upon normal structures causing them to be altered. Others (Mayo, Flint, Rozanoff, Eastman, Schnorr, and Eisendrath), considered them as the vestiges of a filmlike peritoneal fold, reflected upon the ascending and descending colon, from the corresponding lateral parietal wall of the abdominal cavity, and often encountered during the fetal life. Such fold, which originally seems to form a sort of accessory mesocolon, or so to speak a suspensory ligament of these portions of the bowels, is only temporary, inasmuch as normally it becomes atrophied and finally, due to a process of absorption, disappears by the time the fetus has reached its complete development.

In some instances, however, such process is incomplete, and more or less extended films persist in later life and constitute the socalled pericolic membranes, which in many instances interfere with the normal functions of the bowels, and require the intervention of the surgeon. On the other hand, Duval, Roux, Binnie, and others consider the pericolic membranes as the result of a primary pericolitis; others (Hofmeister, Connell, Tavel, Courcieras, Lamy, Duvergey, Haller, Tripier and Faviot, Potherat, Servent,

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Delmas, Legras, Walther, Taddei, Lewis S. Pilcher, and J. T. Pilcher), as the product of an inflammation spreading from adjacent organs (appendix, gallbladder, epiploon, and other structures); others (Doran, Keith, Ballantyne, Veizprenit, Ross and Menche), as the result of a prenatal inflammation of the peritoneum and others (Tosatti, Leotta, Giordano, Mattoli, and Longo), attribute its formation to a plastic peritonitis, caused by invasion of bacteria through an inflamed intestinal wall (ulcerous colitis, mucomembranous enteritis, or typhoid fever), or through the minute tunnels, made through it by intestinal parasites, namely the tricocephalus dispar, which by Hofmeister has been found present in ten out of fourteen of his cases. This author, to further confirm his theory of the inflammatory origin of the pericolic membranes, adduces his finding of infiltrated lymphglands along the posterior aspect of the cecum, at the ileocecal angle, and at the root of the mesentery. Recently M. R. Castex and D. Del Valle put forth their theory of hereditary syphilis as a frequent cause—perhaps the most frequent—of membranous pericolitis and analogous conditions. Others (De Gaetano), consider the pericolic membranes due to the persistence of congenital malformations or structures which are interpreted as a derivation or "the lateral termination" of the prerenal fascia (Toldt's fascia) "a sort of transitional fold between the parietal peritoneum and the visceral layer of the colon." Whatever be the origin of these bands and membranes, the mechanical influence of a repeated, though mild, traumatism is generally admitted.

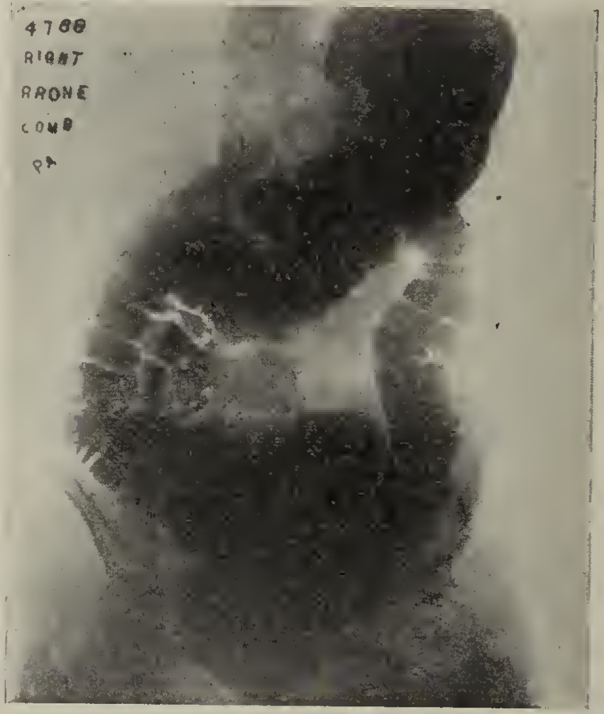

Fig. 1.—Acute angulation of the hepatic flexure of the colon.

To quote Pilcher: "Mechanical irritations and longcontinued and oft repeated mild infections of the peritoneum, covering the cecum, appendix and colon are capable of provoking a proliferative inflammation of a low type, that may create over a greater or less area of such peritoneum a fibrous film, or result in adhesions to adjacent surfaces that ultimately form bands and membraniform sheets." Such traumatic action, rarely accidental, more often may be traced to the effect of constipation associated with enteroptosis, due either to atonic bowels, or to the relaxation following childbearing and obesity, or to improper modes of clothing; or to intermittent, abnormal posture and motion common to certain trades or kind of work (cobblers, blacksmiths, and others). The case, we are about to report, seems to be typical in this respect, though we refer to it as a mere observation, not as an argument.

Case.—Aniello M., born in Pisciotta, Province of Salerno, Italy; aged nineteen. Parents alive and well. As an infant, suffered from measles, chickenpox and recurrent bronchitis. From six to seventeen years of age attended school. However, since the patient was twelve he started to work as a cobbler. It is to be noted that in Italy the cobbler, while soling a shoe, presses the heel or the point of the shoe against the lower part of the sternum with his left hand and at times lays the side of the shoe upon the right hypochondrium and proceeds to cut or tread the sole with his right hand. Often the shoe slips down to the stomach, or little more to the right, hitting the site corresponding to the transverse colon. Both of these organs on account of the peculiar stooping mode of sitting of the cobbler, are somewhat tense and thus more exposed to the intermittent friction of the shoe.

All this accounts for the great number of the well-known gastrointestinal disturbances of the shoemakers and may, in our opinion, explain as a final result the production in them of perigastric or pericolic adhesions, bands and membranes.

At the age of seventeen our patient, during an interval of a few months, suffered from two sudden attacks of colic in the right upper quadrant, both of which were attributed to acute indigestion and relieved by the administration of castor oil and the local application of cold compresses. A year later he immigrated to the United States, and resumed his

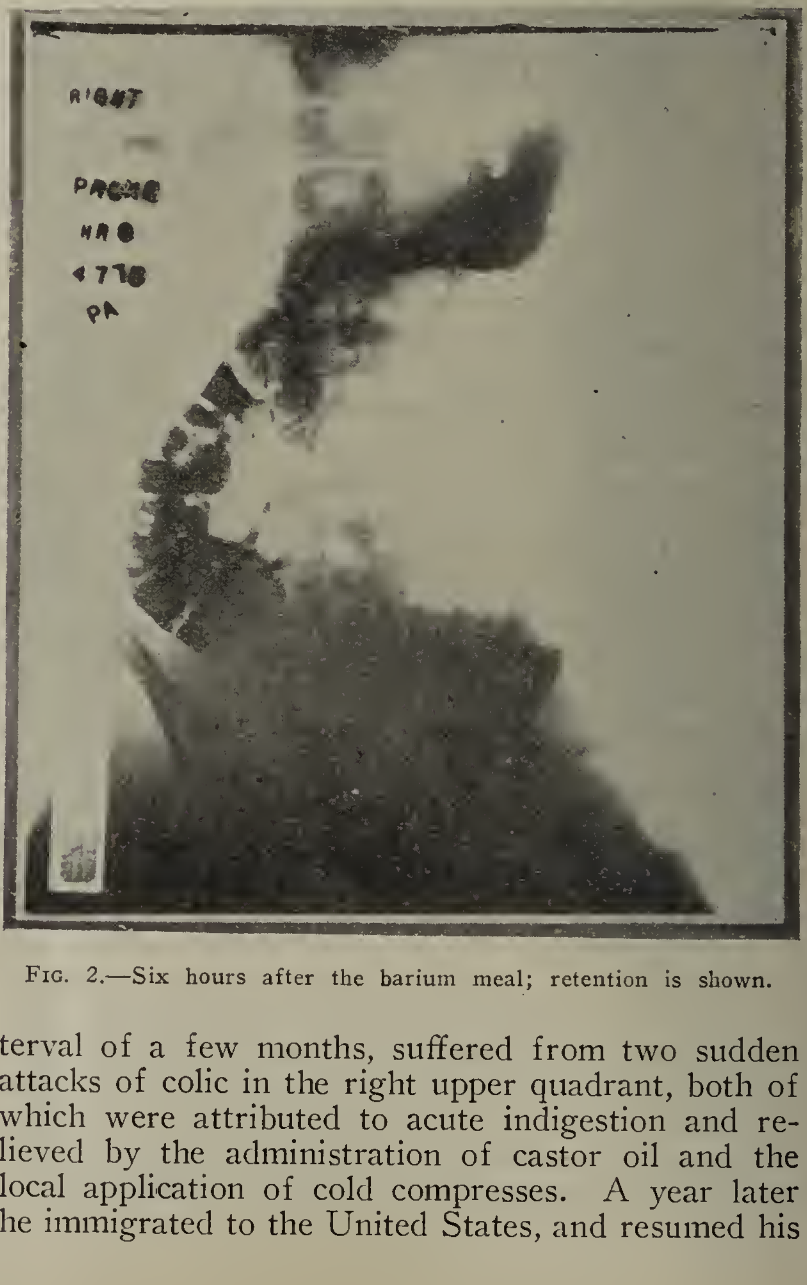

Fig. 2.—Six hours after the barium meal; retention is shown.

habitual work for a short time. About four months after his arrival he began to feel an intermittent, cramplike pain in the epigastrium, radiating mostly to the right hypochondrium. Neither nausea nor vomiting was present but "repeating" and saliva coming up to the mouth, usually in the morning, though sometimes in the course of the day, before dinner or supper. This pain was somewhat relieved immediately after eating; but four or five minutes later it increased in intensity, lasted about two hours, then it abated. The pain was more pronounced when the patient did any motion or was at stool. Lately, he felt an occasional subjective pain in the right iliac fossa wherein by a deep palpation one could elicit but a slight tenderness. The appetite was poor and at times anorexia was present; bowels markedly constipated, kidneys normal, Wassermann test negative. The patient lost about eleven pounds, became anemic and neurasthenic in spite of about four months of accurate medical treatment, which consisted mainly in the administration of mild antiseptic, alkaline, antispasmodic and laxative drugs (benzonaphthol, magnesium oxide, belladonna, phenolphthalein), of gastric lavages, olive oil enemata and of a number of intramuscular injections of lecithin. The chemical examination of the stomach contents one hour after the test meal, revealed a total acidity of about 52, the presence of free hydrochloric acid, but the absence of lactic acid, bile and occult blood. The microscopical examination was negative. Blood count 4,410,000 red blood cells, 9,500 white blood cells, polymorphonuclear leucocytes 65, small lymphocytes 25, large lymphocytes 10.

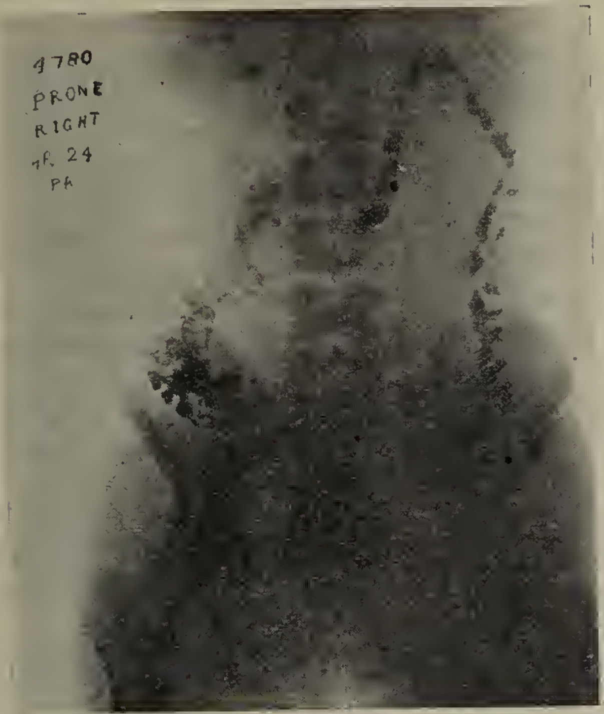

Fig. 3.—The appendix is visualized.

The report of the radiographic and fluoroscopic examination by Dr. H. V. Broeser follows: There was no hindrance to the flow of the barium enema, or adhesions at the under surfaces of the flexures. Colons were mobile. There was an acute angulation at the hepatic flexure of the colons (Fig. 1). The pars descendent adhered to the hepatic flexure in the region of the gallbladder. The stomach was of the orthotonic to hypertonic type, axis oblique; no defects in the gastric outline. Motility and mobility were good. Six hours after the ingestion of the malted milk and barium meal, retention with hypersecretion was shown (Fig. 2). The head of the meal is at the hepatic flexure. The appendix was visualized (Fig. 3), the ampulla dilated (Fig. 1). From the history, the laboratory findings and from the röntgenograms, we made a diagnosis of acute angulation of the splenic flexure of the colon, due probably to adhesions and chronic appendicitis. On September 13, 1921, we proceeded to the operation as follows: An incision was made along the outer border of the sheath of the right rectus muscle, starting about two inches below the costal arch, and extending down to the transverse umbilical line. The gallbladder was found free from adhesions and calculi; stomach and duodenum were normal.

At the hepatic flexure we came across a thin membranous transparent veil spreading to the right, to the parietal peritoneum, sweeping over the ascending and part of the transverse colon and to the left fusing with the gastrocolic omentum. In the thickness of this membrane which was crossed by a network of bloodvessels we could see and palpate a shining strand of connective tissue about five mm. wide. extending from the anterior longitudinal band of the ascending colon to that of the transverse and pulling these two parts together in a way to form an acute angulation (Fig. 4). As this strand was cut between two ligatures and the continuity of the membrane interrupted, the colons were freed and resumed their normal position. To avoid leaving a large area of denuded gut which would undoubtedly have invited the formation of new adhesions, we refrained from excising the membrane. The next step was that of removing the appendix, burying its stump under a double purse string suture of Pagenstecher linen. The appendix proved to be normal. The usual closure in layers of the abdomen followed. The patient made an uneventful, afebrile recovery, leaving the hospital thirteen days after the operation. All disturbances and suffering have disappeared and patient has gained thirteen pounds in three months.

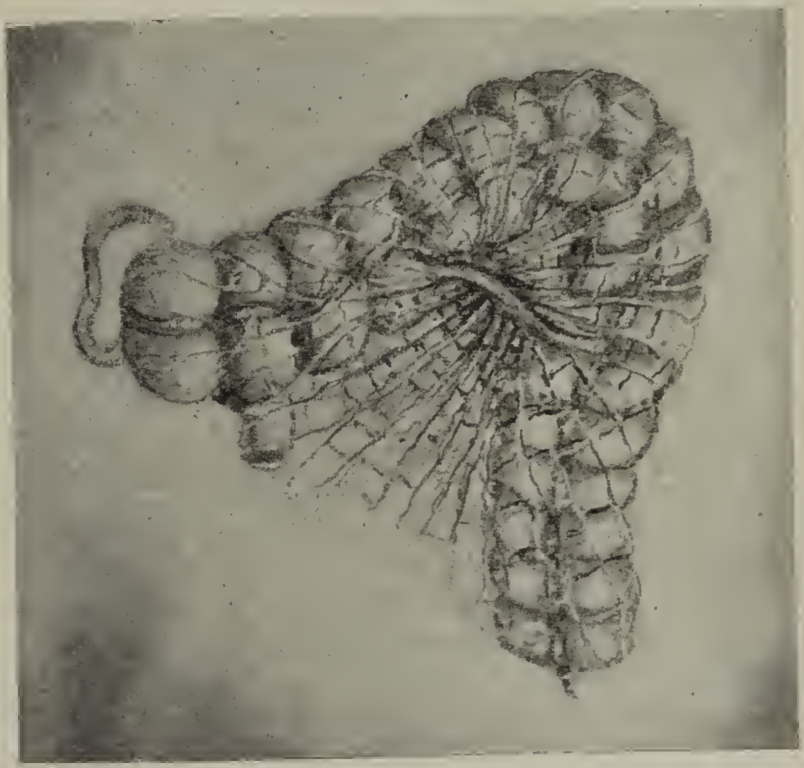

Fig. 4.—Semischematic drawing showing the pericolic membrane and band in the case reported.

This case has been reported to show the rôle, if any, played by the traumatic factor in the pathogenesis of pericolic bands and membranes. Evidently the thick fibrous band found was of traumatic origin. The rest of the membrane, perhaps, was of embryonal origin, but through intermittent irritation or teasing, had been transformed in its structure from a plain serous membrane to a fibrous tendinoid strand (the possibility of such transformation has been proved clinically and experimentally). (Cornil, Ranvier, Tourneaux, and Hermann), and from a possible physiological function of protection or support had been changed to an abnormal action of constriction and acute angulation of the bowels likely to produce an obstacle to the normal peristalsis and consequently a retention of the intestinal contents. The intestinal stasis favoring the development of bacterial life may have, in its turn, caused irritative and inflammatory conditions of the intestinal walls, through which a low grade infection may have been transmitted to the peritoneum adding another element to the production of pericolic adhesions and bands.

On the other hand, M. F. Fallon states that the socalled Jackson's membrane is a congenital, normal, constant, peritoneal membrane and that it is not a membranous pericolitis, with which it is often confused. He agrees with Blake, in considering the socalled Jackson's membrane as a constant, normal structure, and gives the following reasons as a basis for his opinion: first, that he has always found this membrane when he looked for it; second, that it has all the characteristics of a normal, congenital, peritoneal membrane. The investigations of Flint, in both fetus and adult, show that the membrane is congenital and may take its origin from the omentum, or it may result from a dragging down of the peritoneum in the descent, in the fetus, of the cecum from its subhepatic position.

However, the general observation that in the majority of the cases, such membranes do not extend to the cecum, but above it, seems to exclude the latter hypothesis. DeGaetano attributes the origin of the pericolic membrances to a derivation or reduplication of the embryonal mesocolon, at the stage in which this fuses with the prerenal tissues and the parietal peritoneum. This theory, though ingenious, does not seem to be supported by the consideration of the anatomical topography of such membranes, which, according to the description of the embryologists, as well as of the surgeons, are constantly precolic, not retrocolic. Furthermore, the last author states that he has found such membranes in a little more than one third of his cases (ten out of thirty), and consequently is led to admit three varieties of pericolic membranes, namely, congenital, inflammatory, and mixed.

This classification is not quite complete inasmuch as other important pathogenetic factors are not considered. In fact, besides anomalies of fetal structures (developmental factor) a condition of hereditary syphilis (specific factor) or a prenatal inflammation of the peritoneum of maternal origin (congenital inflammatory factor) or the inherent traumatic influences of some trades (occupational factor) or else the deficient or abnormal functions of the glands which preside over and govern the development of the intestinal walls (endocrinic factor) play, either individually or collectively, a not negligible rôle in the formation of pericolic bands and membranes.

To quote Castex and Del Valle: "These malformations on the one hand, and the abnormal function of the nervous system (sympathetic and autonomous), owing to the endocrine deficiencies, produce defects in the gastrointestinal statics and dynamics. As a consequence of the latter we have intestinal stasis which bring on chronic inflammation of the colon. From the wall of the colon the inflammation spreads to the surrounding serous membrane, aggravating the existing congenital lesions."

Concluding we like to repeat the statement of William P. Graves: "No one of the causes which serve as a basis for the preceding theories can explain satisfactorily all of the intraabdominal bands, but it is probable that each one, either independently or in association with the others, plays a part in the formation of a certain number of these structures."

SUMMARY.

Although it is not safe to draw conclusions from a single case, nevertheless, we feel authorized to infer the following corollaries:

1. In every instance of pericolic membranes a double pathogenetic factor should be kept in mind and investigated: the congenital and the acquired.
2. The history of the case, and especially the information about the trade or special kind of work of the patient, may furnish precious data about the pathogenesis of the pericolic bands and membranes.
3. The symptoms are not different from those found in the presence of Lane's Kink or adhesions, i. e., distress in the epigastrium or right hypochondrium, pain and tenderness in the same regions; occasional pain or tenderness in the right lower quadrant, constipation, meteorism, gastric dyspeptic symptoms (bloating, distress after eating, regurgitation, belching, anorexia, and other symptoms), loss of weight and tone; secondary anemia, and neurasthenia.
4. The fluoroscopic and radiographic examination following the combined meal enema affords great assistance in making a diagnosis of pericolic bands and membranes.
5. The treatment should be adapted to each individual case, aiming to remove the cause of the trouble by the separation or exclusion of the disabling structures and to prevent further disturbances by peritonizing the uncovered organs or tissues. If the symptoms recur a short circuit operation should be performed (colectomy, ileocolostomy or ileosigmoidostomy). On the other hand, bands met with, incidentally, in the course of an abdominal operation, and producing no symptoms, should be treated conservatively, for they act as an efficient means of supporting the bowels and preventing their ptosis.
6. The pericolic membranes, in the light of the latest researches, should be considered as vestiges of congenital structures, innocuous *per se*, but often transformed, later in life, in actual pathological entities by new secondary elements, either traumatic or inflammatory, endocrinic or specific, accidental or occupational.

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Removal of Sharp Pointed Foreign Bodies from the Rectum

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The medical man may be called upon at any time to extract from the lower bowel bodies with sharp borders and extremities, which have become lodged in such a way as to cause possible injury by their presence or removal. These may find their way into the intestine with the food, or be introduced from below by accident or design, being caught where the rectum is narrowed, or swept into its folds, valves or pockets. Fish or chicken bones, slivers of wood, pins, needles, nails, and other articles of like character may be swallowed, while others may be forced through the anus and broken. The latter include a variety of objects such as clinical thermometers, glass irrigator tips, sticks, bottles, and other articles too numerous to mention, sometimes made use of by the insane, the sexual pervert, the person under the influence of intoxicants, or one whose sense of humor takes that peculiar slant. They may become tightly wedged into the bowel, or lie transversely across it firmly gripped by muscular action, he fishhooked into the tissues when they are of a peculiar shape, or forced deeply into the soft parts when they have sharp and cutting edges; moreover, if they are of glass, china, porcelain, or other material presenting smooth surfaces, they may be difficult to grasp with a steel instrument. To remove these without injury to the surrounding structures often taxes the skill and ingenuity of the operator. Each case is an individual problem, but there are certain general principles which apply to all.

It will be conceded that when a diagnosis of a foreign body in the rectum is made, the indication is to remove it at the earliest possible time. To delay in the hope that it may be expelled unaided, or to await the action of physics, prolongs the pain, increases the danger of infection, and rarely accomplishes the purpose. Purgatives may indeed be harmful for the further reason that the intestinal stimulation caused by them may force a sharp foreign body deeper into the tissues, increasing trauma, hemorrhage, and danger of puncture of neighboring organs. But if purgatives would thus seem to be contraindicated, enemata of warm water and oil are a great aid, inasmuch as they act on the object from below and cause a pressure in an opposite direction to the one which brought about the impaction. That is certainly true at least of those cases in which it has been driven in from above. In addition, the warm mixture relieves spasm, facilitates removal, and flushes out small particles of glass and other foreign matter. If the body is within reach, careful attempts should be made to disengage it with the fingers or a long handled instrument, but force has no place in the manipulations.

If despite these efforts it can not be extracted, the patient should be given a general anesthetic and the anal sphincters thoroughly dilated. One blade of a Sim's speculum is then introduced into the rectum, on the side opposite where the body is imbedded, and the walls of the bowel are packed with gauze above and below it, since if it should move higher up it would be difficult or impossible to extract it from below. If it lies transversely it must not be pulled toward the anus, but should be pushed up and its direction changed to correspond with the long axis of the bowel. If it has smooth surfaces and sharp cutting extremities or borders, it is necessary to cover it with some substance which will prevent it from slipping from the jaws of the instrument; adhesive plaster will be found useful for this purpose, as I have suggested elsewhere (1). The plaster should be cut into small squares, carried up with an alligator forceps, applied to the edges of the body, and moulded over its sides. Such a precaution not only enables the operator to get a good grip, but lessens the danger of lacerating the walls of the rectum.

It will generally be found that with the patient under anesthesia and the parts thoroughly relaxed, it is likely that no further difficulty in removing the object will be experienced; nevertheless in exceptional cases the question of incising the tissues to make more room will have to be considered. Naturally such an incision would be made posteriorly, where there are no vital structures to be injured, and be closed up when the operation has been completed.

Following the extraction of a foreign body from the rectum, the bowel is to be examined by good light to determine the extent of any injury to the mucous membrane and wall. Small rents, tears, and punctures should be left open to heal by granulation, but the edges of larger wounds must be united by sutures and drained with the usual precautions. It is a waste of time to apply antiseptics to wounds within the rectum, but mechanical cleansing by hot douches and irrigations, repeated several times daily is a useful measure. It soothes pain, carries away the discharges, and prevents infection.

The patient is to be kept constipated by the withdrawal of solid food for a period of five or six days, by the administration of opium, and the promotion of rest and quiet. The bowel walls must be watched for evidence of infection for some time, as it is not at all unusual for perirectal abscess, fistula and similar complications to occur even after the lapse of weeks.

To summarize the removal of sharp pointed foreign bodies from the rectum, the following may be restated:

1. To remove them from below without general anesthesia, if possible; physics are contraindicated.
2. To avoid injury of the rectum by a, protecting its walls with gauze packing, and b, covering sharp edges and sides of body with adhesive plaster.
3. To use a general anesthetic, dilate the sphincters, and perform posterior proctotomy, if unable to deliver otherwise.
4. To prevent secondary infection by a, treating lacerations according to general surgical principles; b, flushing the rectum with hot water several times daily, and c, securing functional rest by opium and restricted diet.

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Primary Nodular Cancer of the Pancreas

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Cancer of the pancreas is still comparatively a rare disease, and for this reason I take the opportunity of presenting a brief clinical report of a case that has recently come under my own personal observation. According to Futcher, of Baltimore, up to June 13, 1919, there were fifty-eight cases in which a clinical diagnosis of cancer of the pancreas was made in 41,949 admissions to the medical wards of the Johns Hopkins Hospital. In thirty-one of these cases the clinical diagnosis was substantiated by either autopsy (13) or operation (18). Of these thirty-one cases, twenty-nine were apparently primary cancers involving chiefly the head of the pancreas. Twelve of the thirteen cases that came to autopsy were either adenocarcinoma or of the scirrhous type. One of Sprunt's cases at autopsy revealed an hemangioendothelioma of the head of the pancreas. Fabozzi has described five cases in which he believed the cancer originated in the Islands of Langerhans. Of Futcher's thirty-one cases, twenty-two were males and nine females. Fifteen of the cases occurred between the ages of forty-one to fifty; fifteen cases occurred between fifty-one to seventy; the youngest patient in Futcher's series was a man aged thirty-four years. There was only one colored patient among these thirty-one cases, although the proportion of colored to white admissions in the medical wards at Johns Hopkins Hospital is about one to seven.

Among thirty-two cases of primary cancer of the pancreas at the Vienna General Hospital, it was found in the head of the organ in twenty cases. Mirallié states "in general the head of the pancreas is the seat of the disease."

SYMPTOMATOLOGY.

The most important symptoms are: pain, jaundice, gradually increasing in intensity, emaciation, enlargement of the gallbladder, palpable tumor, and symptoms due to the obstruction of the pancreatic secretion (external). Other symptoms that may occur in some of these cases are: glycosuria, distention of the gallbladder, enlargement of the liver, edema, vomiting, fever, and ascites.

Pain is often the first and most persistent of the symptoms; it is usually referred to the pit of the stomach radiating towards the back or shoulders, or may be situated chiefly in the right hypochondrium, particularly when the head of the gland is chiefly involved. Sometimes the pain may be of intermittent colicky character. The pain grows worse with the progress of the disease in some of the cases.

Jaundice is a common symptom and often the first and only one for a considerable period. It is persistent and becomes more and more intense with the progress of the disease. Jaundice appearing quite suddenly without pain in a patient past forty years of age and accompanied with an enlarged gallbladder, usually means cancer of the head of the pancreas or the common bile duct. Jaundice was present in about twenty-three of the thirty-one cases studied by Futcher. A palpable tumor was present in twelve of these cases. The mass was usually felt in the epigastrium and extending more to the right, because the head of the pancreas is usually affected. Only thirteen of Da Costa's 137 cases showed a palpable tumor.

Patients often lose weight rapidly, probably due in part to the shutting off of the external pancreatic secretion from the intestinal tract. Microscopic examination of the stools will often show neutral fat globules or abundance of fatty acid crystals; however, Mirallié found only nine cases with fatty stools among 113 instances of pancreatic cancer. Frequently the patients will have clay colored stools. Quantitative estimation of the stools for the various pancreatic enzymes, trypsin, steapsin and amylase, according to Brown, is of considerable value in the diagnosis of pancreatic disease. Distention of the gallbladder occurred in twenty-one of Futcher's thirty-one cases. Courvoisier found that with obstruction of the common bile duct due to biliary calculi, the gallbladder is usually contracted, while if the occlusion is due to malignant disease or other causes, the gallbladder is generally enlarged (Courvoisier's Law). Opie believes that contraction of the gallbladder with biliary calculi is due to inflammatory changes, while with obstruction due to pancreatic cancer or other causes, inflammation is usually absent and the thin walls of the gallbladder permit it to become distended.

One would expect to find frequently glycosuria in cases of cancer of the pancreas, particularly with extensive involvement of the gland. Glycosuria, however, is an infrequent symptom in pancreatic cancer. Mirallié found glycosuria in thirteen of fifty cases. Futcher found only three of thirty-one cases showed glycosuria. Ecklin found that in sixty-one cases of obstruction of the common bile duct due to pancreatic cancer the gallbladder was dilated in fifty-eight. Enlargement of the liver occurs in some cases—and when so enlarged, is not due to liver metastases.

Of 113 cases of primary carcinoma of the pancreas collected by Mirallié, ascites was present in thirteen.

DIAGNOSIS.

Given a case, the chief symptoms of which are epigastric pain, persistent jaundice of gradually increasing intensity, a palpable epigastric mass, an enlarged gallbladder, with progressive loss of weight and cachexia, we must always think of pancreatic malignancy in making a differential diagnosis. We may of course have symptoms also that are referable to disturbance of the internal and external secretion of the pancreas. Pain may often be absent in cases of pancreatic carcinoma.

In cholelithiasis, the attacks of pain are more likely to be colicky in character and the jaundice is usually abrupt in its onset and is intermittent. Chills and fever (Charcot's hepatic intermittent fever) are more likely to be present in cholelithiasis than in cancer of the pancreas. In thirteen of Futcher's cases of cancer of the pancreas, fever of a moderate and intermittent type was present. In only one instance of this series was there an accompanying cholelithiasis. The gallbladder, while often palpably enlarged in pancreatic cancer, is as a rule not palpable in cholelithiasis. The diagnosis between primary cancer of the pancreas and malignancy arising from the common bile duct or duodenum is practically impossible. The jaundice resulting from hepatic cancer, carcinoma of the stomach, duodenum or bile ducts, compressing the common bile duct, has the same gradual onset and progressive character as jaundice occurring in cases of cancer of the pancreas. The weakness, loss of weight and emaciation usually progress less rapidly in cancer of the liver, stomach or bile ducts.

TREATMENT.

Medical treatment is unsatisfactory. Pancreatin in five or ten grain doses may be given. Powdered caroid with diastase and pancreatin may be given in combination. Menthol and phenol lotions for the itching of the skin.

Operative treatment also has been unsatisfactory, and the outlook is usually grave. A cholecystenterostomy or a cholecystgastrostomy or a biliary fistula operation may be performed, in the hope that some relief may be afforded to the patient, even if only temporary in duration.

The treatment (1) is therefore practically hopeless, and is chiefly for temporary relief only. Deaver (2) says that carcinoma of the pancreas is not a frequent condition. He believes the gallbladder becomes distended in about half of the cases, due to the back pressure of bile caused by the obstruction of the common duct. Pain, according to Deaver, is not a prominent symptom, although when present it occurs late in the disease and usually is deep seated and likely to be severe, marked by exacerbations and radiations to the back and the lumbar region.

Often the first signs of the disease are those of indigestion, followed by the onset of jaundice, dilatation of the gallbladder, unassociated with previous biliary colic, deep seated pain in the epigastrium or the liver, radiating to the back or the lumbar region, anorexia, anemia and rapidly progressive emaciation.

Leopold Oser (3) covers the subject of diseases of the pancreas very thoroughly. He states that carcinoma of the pancreas is the most important and frequent of the new formations in this organ. Soyka found three cases of primary cancer of the pancreas among 3,950 autopsies. Biach, among 18,069 autopsies in the Vienna General Hospital, found twenty-two pancreatic cancers. There were six pancreatic carcinomata in 5,065 autopsies in the Wiedener Hospital. In the reports of the Vienna General Hospital from 1885 to 1895 there are recorded thirty-two cases of primary cancer of the pancreas.

According to Oser the most frequent variety is the fibrous cancer with hard, dense nodules. In all probability, the first successful operation on pancreatic cancer was performed by Ruggi in Bologna in 1889.

CASE REPORT.

Case.—Mrs. Anna R., white woman, widow, aged fifty-seven, housework. The chief complaints were jaundice and constipation and some dyspeptic symptoms. Her parents died from an unknown cause. Her husband died several months after an operation for bilateral hernia, probably had tuberculosis or cancer. Had three sons and two daughters living. One daughter had mild hyperthyroidism. One son in law died of pulmonary tuberculosis. She had had measles, whooping cough, and frequent sore throat. In July, 1912, Dr. Bland performed a hysterectomy at the Jefferson Hospital on account of a "bleeding tumor." A second minor operation was performed in 1913.

She had been ill for four or five months. Complained of indigestion and discomfort in epigastrium and jaundice. Lost about twenty or more pounds in weight during four months. Her appetite was poor, did not drink much water. There was no vomiting, some pain in the region of the gallbladder, constipation, no severe pain. The yellowness was getting worse. There was no itching of the skin. She slept well. There were no circulatory or respiratory symptoms and no urinary symptoms.

The patient was very markedly jaundiced; it was a deep grade of jaundice, affecting the mucous membranes. Her temperature was normal. Heart, eyes, ears, and throat and lungs were negative. The teeth were in poor condition. The liver was enlarged, there was some resistance over the gallbladder region. There was an apparent mass a little below the epigastrium that may have been a growth affecting the head of the pancreas and possibly involving the gallbladder. The jaundice suddenly appeared without severe pain and with a distended gallbladder and an enlarged liver indicating a malignant growth in the pancreas or common duct. To relieve the cholemia an exploratory incision should have been made and a cholecystgastrostomy performed.

The blood pressure was systolic 140, diastolic 90.

Uranalysis, March 2, 1922, light amber, flocculent sediment, acid, specific gravity 1.014, trace of albumin, no sugar, bile positive, no casts, twelve to fifteen white blood cells to the high power field, no red cells. March 8, 1922, acid 1.016, faint trace of albumin, no sugar, bile positive, ten to twelve white cells to the high power field, many squamous epithelial cells. March 20th, amber, acid reaction, specific gravity 1.015, faint trace of albumin, no sugar, bile positive, three hyaline and three granular casts to the low power field, few squamous cells.

Blood, March 6, 1922, red cells 4,100,000, white cells 8,400, hemoglobin eighty per cent., small lymphocytes twenty-eight, large six per cent., transitionals one per cent., polymorphonuclear sixty-four per cent., eosinophiles one per cent. March 22nd, red cells 4,200,000, white cells 8,400, hemoglobin sixty per cent., Talquist sixty per cent., Sahli sixty-eight per cent. March 30th, red cells 3,410,000, white cells 8,200, hemoglobin sixty-five per cent., blood Wassermann negative, coagulation time, March 17th, nine minutes. March 14th, creatinine 2.9 mg. to the 100 c. c. of blood, uric acid 1.9 mg., urea nitrogen 19 mg., nonprotein nitrogen 33 mg.

GASTRIC ANALYSIS.

March 3, 1922, lactic acid negative, blood positive,

	Fasting	1	2	3	4	5	6	7	8
Free hydrochloric acid.......	28	12	49	38	45	28	33	27	51
Total acidity	55	40	85	90	81	62	60	60	75
Combined acids	17	18	15	30	14	18	12	12	13

Microscopical examination showed few esophageal epithelial cells, few red cells, occasional clumps of leucocytes showing nucleii only. Culture of the bile was negative. Examination of feces showed a liquid mushy, green stool with no mucus, positive occult blood, pus negative, bile negative, reaction acid, no parasites, no ova, negative for starch, positive for fat, no curds, no concretions, a few spiral vegetable cells, a few partially digested muscle fibres, other vegetable cells and muscle fibres.

Blood typing showed patient's blood to be of type 2.

Röntgenographic examination of the stomach showed no defect of outline, peristalsis regular and somewhat increased. The lowest point of the greater curvature was at the interspinous line. Bulbous duodenum, large, filled completely. At six hours, all the barium was in the ileum. At twenty-four hours, the head of the column was in the rectum, the tail in the cecum. There was a small fragment of barium to the inner side of the cecum, probably in the appendix. The colon was somewhat spastic. At forty-eight hours there was a residue in the rectum and the sigmoid, and a few fragments in the right iliac fossa.

DIAGNOSIS.

No ulcer or new growth of the stomach or duodenum, hyperperistalsis of the stomach, ileal stasis at six hours and spastic constipation at twenty-four hours point to extrinsic irritation probably in the gallbladder. The patient died several hours after operation, a cholecystgastrostomy was performed by Dr. George P. Müller. A nodular carcinoma of the head of the pancreas was found. No gallstones were present. Blood transfusion was done, but without results, the patient dying of shock.

Chiari, Paulicki, Mayo, Lépine and Cornil, Litten, Chvostek, Briggs, Krönlein, Aldor, Neve, Machada Schueler, Lubarsch, Lockwood, and others have reported cases of sarcoma of the pancreas (4).

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1425 Broadway.

Cancer of the Rectum in the Presence of a Four Plus Wassermann*

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As may be inferred from the title of this article, the case I wish to present for your consideration is remarkable in that it furnishes the association of two grave maladies which are so different in their etiology, course and mode of treatment.

Case.—Mrs. R. S., fifty-four years old, widow, janitress, referred to the gastrointestinal department of the Bronx Hospital January 2, 1922. Her parents died at age of from fifty to fifty-five from an unknown cause. Her husband succumbed to nephritis. A sister died of a "complication of diseases." Another sister, fifty-eight years old, had a cataract on the left eye and had lost the sight of the right eye through iritis. The patient had been pregnant twice, the first pregnancy having been interrupted at the eighth month, she stated, "because of a small pelvis." She carried out a second pregnancy, delivering a full term fetus which died in a few hours from an unknown cause. She had had her menopause at forty-two. Her past history was negative, except for diseases of childhood. She denied venereal disease.

Her symptoms began in the fall of 1919. Her chief complaints were pressure in the rectum, increased by the recumbent and sitting positions, alleviated in erect posture, and borborygmi. She had a desire to get rid of gas pressing in the anus. Her sleep was disturbed by gases which, however, yielded to alkalies. She had constipation alternating with diarrhea. Her defecation was frequently involuntary, especially during sleep. The maximum stool interval was two to three days. She did not resort to enemas because of pain in the rectum in administration, and inability to retain them. Urination was interrupted by sudden pressure in the suprapubic region, and could not be fully effected. She had a feeling of weakness, exhaustion, and fatigue, in spite of having a good appetite. The patient had suffered a marked loss in weight, which fell from a maximum of 125 pounds in 1915, to eighty-eight pounds now.

An abstract of the records of the Bellevue and Allied Hospitals showed the following: The patient "was admitted to this hospital December 1, 1919, left the hospital at her own request and against the advice of the physicians in charge on December 9, 1919. She was again admitted complaining of pain in the rectum which has been persistent since the spring of 1919. The pain was dull, aching in character, becoming more severe upon bowel movement.

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*Read before the Clinical Society of the Bronx Hospital, April 10, 1922. From the Department of Gastroenterology, Bronx Hospital and Dispensary.

There had been considerable bleeding following defecation also considerable loss of weight. Physical examination showed an ulcerated hard mass about three inches above the sphincter. This mass bled easily upon examination. On December 4, 1919, the Wassermann reaction was reported as negative. On September 3, 1920, the Wassermann was reported as two plus. The diagnosis was doubtful as between a carcinoma of the rectum or a specific involvement of the rectum. According to the records the only treatment the patient was given were two injections of neosalvarsan."

The points to be stressed, thus far, were: 1. A marital history suggestive of syphilis. 2. A sanguineous and mucous diarrhea, alternating with constipation. 3. A marked loss of weight. 4. Exhaustion and progressive weakness.

The physical examination the date of admission, January 22, 1922, showed the patient to be asthenic, anemic, hyposensitive. The abdomen was scaphoid. with a flaccid wall and tenderness along a line extending between umbilicus and right anterior superior iliac spine. The spleen and liver were not palpable. The pupils were contracted, responded sluggishly to light and accommodation. The right knee jerk was exaggerated, the left diminished. Digital examination of the rectum disclosed a large infiltrating mass on the left side extending above anal opening to sigmoid, with a smaller mass just opposite first one. The examination caused a copious mucosanguineous discharge, of foul smell. The sigmoidoscopic examination revealed large infiltrating highly vascular masses, the instrument passing beyond with difficulty. The mucous membrane was adherent and injected.

The stomach analysis showed free hydrochloric acid 24, total acidity 36. The blood sugar tolerance test 0.11 per cent. The blood Wassermann reaction was reported as four plus. The hemoglobin was forty-five per cent., white blood cells 4,400, red blood cells 3,350,000. The uranalysis was negative, röntgenologic study showed the stomach and duodenum to be negative. The ingested meal and barium anema disclosed the entire sigmoid irregularly and defectively filled, and adherent to the surrounding structure. The ampulla of the rectum were also involved. The radiographic diagnosis was carcinoma of the sigmoid.

PROGRESS OF CASE.

The patient was given two salvarsan injections, which aggravated the clinical symptoms. The results of the proctoscopic examination made by Dr. W. Klein was reported as follows: In examining Mrs. R. S. sixteen days after the first examination, and after salvarsan had been given, I found the following conditions: The eggshaped tumor noticed in the previous proctoscopy on the right side of the rectal wall had not changed much, it may have become a little smaller. On the left side the growth had markedly enlarged. Its surface was eroded and bled freely. The proctoscope could not pass beyond (the mass) as it did in the previous examination. Large masses could be felt extending beyond. The disease had evidently progressed rapidly in the sixteen days since the previous examination.

It seems to me that the entire case rests upon this one aspect of it: namely, that upon the injection of salvarsan, the condition of the patient was markedly made worse, viz.:

1. There was no resultant lessening of pain, which we know is the greatest virtue of therapeusis. On the contrary, pain was greatly intensified.
2. There was no decrease in the size of the tumor.
3. The course of the tumor, which the history shows to have been hitherto comparatively quiescent, acquired a new stimulus.
4. There was no resultant trend toward the restoration of the normal function of the involved region.

The prevalence of good appetite during treatment is an apparent exception, which loses its significance because the patient's desire for food was largely psychic. She was necessarily encouraged to hope for a favorable issue, and this cheered her up appreciably. Forchheimer (1) states that "victims of malignancy seem to be to a very high degree suggestible and impressionable, and respond nobly to every therapeutic effort." He cites a case recalled by Osler, wherein a patient with a gastric cancer was relieved of digestive disturbances and even gained eighteen pounds in weight because a sanguine consultant denied the presence of a tumor.

From the facts stated above, I believe these inferences are justified: 1. That the tumor was malignant. 2. That when malignancy is concomitant with the treponema pallidum, the latter is antagonistic to the former. Here I would direct your attention to the use of the term concomitant in contradistinction to the term symbiotic. I have heard these terms used interchangeably. Yet the difference between them is marked, and, in this case, I believe, their distinction goes to the root of the relation between the two diseases.

What is symbiosis? Hiss and Zinsser (2) state that it is the coexistence of two varieties of microorganisms in the same habitat, under a condition which favors the development of both. Such a condition is present, say these writers, where, in cultures containing both aerobic and anaerobic bacteria, the former permits the development of the latter by monopolizing the supply of free oxygen. Forchheimer (3), speaking of the rôle symbiotic bacteria plays in amebiasis, says they accompany the amebæ into the deeper layers of the intestine and then to the liver and brain; and in cases of generalized amebiasis, elsewhere. When, however, one variety inhibits the growth of another, probably because of the action of the metabolic products of the predominant species upon the less vigorous variety, the relation is termed antagonistic symbiosis. Thus, it will be observed that symbiosis, whether it is antagonistic or not, is concerned solely with diseases produced by bacteria.

For reasons which I shall develop more fully in this paper, it appears to me that this case does not furnish an instance of symbiosis; or stated specifically, that the carcinoma is traumatic in its origin, a result of irritation, and therefore concomitant with syphilis. However, we have here an interesting analogy to antagonistic symbiosis, for the facts in this case warrant the inference that the spirochete pallida, like certain other microorganisms, is actively antagonistic to cancerous cell proliferation.

Lynch (4) says that the streptococcus of erysipelas, when alone, or when mixed with such other bacteria as the Bacillus prodigiosus, cured some cases of cancer. He calls attention to Coley's fluid, which is a combination of the microorganisms mentioned, stating that it has been used with largely favorable results in inoperable sarcoma. He also cites Durante, who has noted the cure of two cases of cancer by an intercurrent attack of erysipelas. The history of the case under review shows that the growth was comparatively quiescent, and that only when the treponema was attacked by salvarsan, thereby leaving that "insatiable monster" carcinoma to pursue its course alone and unchallanged, that the condition of the patient grew worse.

The priority of lues over the cancer is made evident by the history of the case, its clinical symptomatology and duration, and the fact that a serological study gave a negative hemolysis. However, we must admit that positive Wassermann tests were obtained in diseases other than syphilis. Indeed, *Nelson's Loose-Leaf Medicine* (5) states, "The Wassermann test may be conclusive or misleading. A case may have a positive Wassermann reaction while in the advanced stages of malignant disease of the colon, sigmoid or rectum." To this list, tuberculosis and diabetes mellitus should be added, for we are confronted with a positive Wassermann reaction in these diseases. The probable form of tuberculosis which must be eliminated here, is the type of the infection conducive to a stricture of the rectum. A primary tuberculosis of the bowel is exceedingly rare, for the focus is usually elsewhere. It is pointed out by Lynch that about fifty per cent. of the cases of pulmonary tuberculosis have a secondary infection of the bowel, and he does not see how it is possible that a patient with primary tuberculosis on which a bowel tuberculosis is superimposed, can live long enough to reach the stricture stage. Moreover, if the disease joined with syphilis really is tuberculosis, then, instead of aggravating the maladies, the injection of salvarsan would have had a favorable effect. For syphilis and tuberculosis are truly symbiotic. Watkins (6) says that tuberculosis and syphilis may occur simultaneously in the same lung and produce, each its own lesion, frequently distinguishable on the radiograph. It thus may be concluded that there is no antagonism between the bacteria of these two diseases. Potter (6) concludes from a number of instances that prompt employment of salvarsan or neosalvarsan is indicated in latent chronic or moderately active tuberculosis; and that there is a contraindication only in the active, acute and diffuse miliary tuberculosis. To all of which should be added that there is nothing in the history or physical examination to point to tuberculosis.

Diabetes mellitus should be discarded as a probability, if but on this one dictum of Allen: "Without hyperglycemia, there is no diabetes." And it will be recalled that in addition to negative urinary findings, the blood sugar tolerance test was 0.11 per cent.

In this connection it is pertinent to mention that Friedenwald and Grove (7) accent the value of the blood sugar tolerance test as an aid in the diagnosis of carcinoma. They state that a hyperglycemia has been observed in patients affected with carcinoma, and that Freund in 1885, having observed the absence of a hyperglycemia in sarcomatous patients, recommended that blood sugar estimation be made as an aid in the differential diagnosis between sarcoma and carcinoma. However, in this case, as stated, a blood sugar tolerance test was negative. It goes without saying that a histological study of a section would have helped to establish a diagnosis as between sarcoma and carcinoma. But the consensus of opinion was against this mode of procedure, through fear of flaring up an angered mass of malignant cells.

Without entering into an extended discussion of the theories prevailing in respect to malignancy, it is perhaps worth our while to refer to the basic theory of its origin, as well as the diagnostic steps that led to the conclusion that the tumor is malignant.

Considering the location of the tumor, the most plausible explanation would seem to be that its origin was traumatic, in other words—a result of irritation. It is significant that tumors of the bowel should have a predilection for locating in the rectum, where irritation is constant and excessive. A survey of the gastroenteric tract shows that the most common site of malignancy is the stomach. If we but recall that during an ordinary meal, the processes of digestion demand more than two thousand peristaltic waves, this being repeated three or four times every twenty-four hours, the effect of these waves as a mechanical irritant is obvious. Next, in the order of their frequency are the rectum, sigmoid, the hepatic and the splenic flexures, the cecum and the appendix. As a matter of interest, it may be here also noted, in passing, that syphilis, which is here concomitant with cancer, also has a marked predilection for the rectum and so is located there more frequently than in any other part of the digestive tube.

A contributory source of irritation is the accumulation of refuse in the rectum. It is retained there for a longer time than anywhere else in the digestive tube. The small intestine is therefore comparatively less subject to irritation from the fecal current, and is consequently rarely affected with primary tumors.

Now, if this theory of irritation appeals to us as plausible, is it not logical to assume that at a site subject to chronic and excessive irritation, during a time of lowered resistance and diminished vitality, the cells, angered by traumatism, found a suitable base for engrafting the nucleus of what in time assumed the proportion of a carcinoma? In this respect the cancer engrafted upon the base of an old gastric ulcer offers a striking analogy.

In conclusion, I wish to reiterate my belief that the treponema is actively antagonistic to carcinoma, in other words that the treponema holds the carcinoma in abeyance. This is supported by the fact that as soon as conditions were rendered unfavorable for the treponema to thrive (because the salvarsan had destroyed the antagonistic powers of the microorganism) the cancerous growth resumed the process of epithelization.

Dr. Brown (8), of the Rockefeller Institute, replying to an inquiry of mine, as to the effect of salvarsan on carcinoma, stated in part as follows: "In regard to the effect of salvarsan on carcinoma, we have no definite information. In our own laboratory, however, we have noted that the administration of salvarsan to animals with transplanted tumors will frequently give rise to pronounced increase in the growth. This may or may not be applicable to human disease."

As to treatment, even in the face of a four plus Wassermann, a colostomy is indicated. When, however, it is considered that the patient is cachectic, that the growth is extensive, and the general vitality reduced to a minimum, such a procedure becomes inadvisable. It is certain the operation would not save her life, and there is sufficient reason for concluding that it would not even prolong it.

The use of such a treponemacidal agent as salvarsan to render the patient Wassermann negative, as was attempted in this case, is contraindicated because of epithelization of the neoplasm. Therefore the treatment in this case is wholly symptomatic.

Acknowledgment is made with thanks of the kind cooperation of Dr. W. Klein and Dr. S. Feldman, of the Bronx Hospital staff.

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544 West 150th Street.

The Treatment of Renal Affections by Mineral Waters and Baths

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From the clinical point of view, which in many respects does not fully agree with the purely anatomicopathological, there are three main groups of renal affections, namely nephritis, nephrosclerosis, and nephrosis. Among the therapeutic measures at our disposal for the treatment of these affections, we have mineral waters which promise good results, when properly selected and judiciously used.

In acute hemorrhagic glomerulonephritis, where obstipation appears in the course of the disease, balneotherapeutic measures may be applied at home. It is noteworthy that obstipation is a frequent and untoward complication, especially occurring while the patients are on a hunger or thirst diet. Here, the use of spring waters containing small quantities of the sulphate of magnesium or sodium, or moderate doses of Epsom salts, often produce the desired result. Without entering into any discussion of the feasibility of administering bicarbonate of soda and calcium in acute nephritis, we should like to point out that the systematic use of alkaline or earthen springs is not appropriate in these cases; assuming that the administration of alkali or calcium influences favorably the course of an acute nephritis, such procedure seems to be unsuitable in the form of alkaline waters, or waters containing earths, since, considering the small percentage of the corresponding ions contained in those mineral waters, there would be needed such great quantities of these waters, to attain the desired result, that an overburdening of the vascular system would inevitably follow and cause harm. In my opinion a trial with small quantities of water containing earths should be made only in hematurias of long standing, since, according to W. Frey, the calcium therapy has proved to be good in such cases.

There is no contraindication to the cautious application of sweat procedures (hot air and electric light boxes, which increase the temperature of the body much less than the steam bath, are preferable) whenever there exists renal edema. Their favorable influence is not brought about by relieving the kidneys of their work, through an increased function of the skin, but by improving the blood circulation in the kidney and thus producing an increased diuresis, because the quantity of sodium chloride and nitrogenous constituents eliminated through the perspiration is very small. However, when there are symptoms which point to eclampsia, or when there is a uremic tendency, or when the function of the heart is impaired, sweat procedures are contraindicated. In any case the temperature should never exceed 50° C., and the sweat procedure should not last longer than fifteen minutes. The same is true in cases which exhibit any considerable increase of blood pressure.

In general, indifferent water baths of 34° to 35° C. lasting almost an hour, are always to be preferred to sweat procedures. Apart from the fact that they help to increase the excretion of urinary substances, even beyond the duration of the baths (as has been proved by the thorough examinations of A. Strasser and Blumenkranz), and thus influence favorably the course of the disease, they also tax the heart much less than the sweat procedures do; their application is an easier one and they are more agreeable to the patients than sweat procedures.

In those cases in which the diagnostician is in doubt as to whether the nephritis is still in the acute stage or has already become chronic, in other words in the transition state from the acute to the chronic form of nephritis, the question as to the use of balneotherapeutic measures will be answered by considering the general state of health of the patient and the prevailing symptom complex. Whenever there exists renal edema, with monotony in the dilution and concentration tests, the use of permanent indifferent baths is to be recommended. Whenever the cardiac symptoms stand out prominently, it will depend on their seriousness on the one hand, and on the general state of the patient on the other, whether or not such balneotherapeutic measures shall be used as will be discussed later in connection with chronic nephritis.

In chronic nephritis the balneotherapy plays a much more important rôle than in acute nephritis. Mineral waters are exceedingly valuable, especially in those cases which have been named by Eppinger the "stationary form of chronic nephritis." These cases are synonymous with Volhard's "chronic state of the diffuse glomerulonephritis, without insufficiency of the kidneys, but with permanent increase of the blood pressure." On account of the irreparable pathological changes in the glomeruli, which entail the degenerative process in the corresponding urinary tubules, thus causing the permanent form of chronic nephritis, we must content ourselves in our therapy simply to prolong the renal sufficiency by aiding the elimination of nitrogenous substances. Therefore the most important aim of our treatment will be to prevent the onset of an insufficiency of the circulation, by lessening as much as possible the existing overexertion of the heart, as evidenced by the constant increase of blood pressure and cardiac hypertrophy. For this purpose the carbonic acid baths should be considered first of all. The effect of such baths is a dilatation of the skin vessels, and a contraction of the peripheral as well as of the renal vessels, with an antagonistic dilatation in the remaining vascular areas. The stimulus produced on the terminal nerve endings in the skin by the carbonic acid bath is conducted by way of reflexes to the exciting sympathetic nerve and to the depressor vague nerve. According to the susceptibility of the one or the other, a regulation of the function of the heart will be attained in a useful manner. Empirical knowledge and research corroborate the eminently favorable influence of the carbonic acid baths on the circulation. Carbonic acid baths frequently reduce also renal edemas; this fact should be explained by their influence on the peripheral vessels, inasmuch as the supposition is justified that chronic nephritis is associated with general vascular lesions.

A relief of the congestion in the portal region, resulting in a general improvement of the circulation, is attained in an ideal way by mild but sympathetic purging. The cold, alkaline saline mineral waters (springs containing sulphate of sodium) are especially suitable for this purpose. These mineral waters, containing an abundance of sulphate ions, owe their purgative efficiency to the fact that the sulphate ions are not easily absorbed, and therefore cause no irritation of the intestines, even if taken for a long time.

Most appropriate for the treatment of patients suffering from chronic nephritis are those bathing places which have at their disposal carbonic acid baths as well as cold ,alkaline saline springs, the latter to be used for drinking cures. Among such spas are the following: Tarasp-Schuls in the lower Engadin (Switzerland; 1,200 meters above sea level), Marienbad (Bohemia; 640 meters above sea level), Elster in the Saxonian Vogtland (457 meters above sea level), Franzensbad (Bohemia; 423 meters above sea level). In those cases, where there exists a considerable increase of blood pressure, the choice of a bathing place of lesser altitude than one thousand meters is to be recommended, because experience teaches us that such patients do not fare well beyond that altitude. The other climatic points do not have to be considered as they have no influence upon chronic nephritis. As to the fear of catching cold in a rough climate—the socalled colds often producing an acute exacerbation of a chronic process—we may dismiss this consideration because the places mentioned do not come into consideration except during the summer time.

In the course of chronic nephritis with hypertension, periods of considerable heart insufficiency may set in: oliguria, dropsy, edema, and other stasis symptoms and it will depend upon the intensity of these symptoms whether we shall advise the patient to expose himself to the inconveniences of a long journey to a distant spa. The choice of the spa will depend to a great extent upon the distance and upon good railroad facilities. In such cases we must think especially of places which offer carbonic acid baths: Elster, Franzensbad, Gleichenberg, Homburg von der Höhe, Kissingen, Marienbad, Nauheim, Rohitsch, Steben, and similar places. A drinking cure with waters containing sodium chloride is contraindicated, if the patient desires to go to one of the places mentioned. Cold sodium sulphate waters also necessitate considerable caution in their use because of their efficacy upon the intestinal tract. Magnesium sulphate waters are preferable when given even in small quantities. We do not advise the use of carbonic acid waters or any other waters reputed for their diuretic effect in cases of chronic nephritis with heart insufficiency as their diuretic effect, if present, is hardly worth mentioning. Furthermore, waters rich in carbonic acid often cause an inflation of the stomach and intestines, pushing the diaphragm upwards and thus interfering with proper heart function. We should avoid overcharging the circulation with too large a quantity of liquid, and, last but not least, alkaline waters should be abstained from in these cases because they increase the possibility of edema.

In the final stages of chronic nephritis with permanently heightened blood pressure with symptoms of renal insufficiency (secondary contracted kidney) we resort to the same balneotherapeutic measures which we have found indicated in the course of chronic nephritis complicated by heart insufficiency, provided the general state of health is still favorable, and the heart insufficiency not too serious. In this final stage of chronic nephritis with increased blood pressure we should abstain from using purging water cures as the ingestion of liquids should be cut down as far as possible. For this reason only small quantities of cold sodium sulphate or magnesium sulphate waters are allowed.

Chronic nephritis without blood pressure increase embrace the socalled focal glomerulonephritis (including also Volhard's septic interstitial nephritis and embolic nephritis). The renal function as a rule is good. This is explained by the large number of glomeruli which have remained free from any pathological changes. The use of moderately warm acratothermal baths (Ragaz-Pfeffers, Römerbad, Schlangenbad, Tüfer, Teplitz-Schönau, Wildbad) improves the renal function in these cases (A. Koehler); the same is true of moderately warm mud baths, or iron baths containing carbonic acid (Cudova, Driburg, Flinsberg, Homburg, Königswart, Liebenstein, Pyrawarth, Pyrmont, Schwalbach, St. Moritz and others) with temperatures of from 34° to 35° C.

The nephroscleroses are also in many a respect amenable to balneotherapeutic measures. Volhard distinguishes between benign (sclerosis of the renal vessels) and maligne (genuine contracted kidney), while Eppinger considers rather the clinical course and distinguishes between relatively compensated and cardially decompensated nephrosclerosis. In the first group of cases, which rarely cause any subjective complaints on the part of the patient, in spite of the considerable increase in blood pressure, purging is indicated, and may be accomplished by prescribing magnesium sulphate or cold sodium sulphate waters or epsom salt. Carbonic acid baths are recommended in these cases because the therapy in these patients concerns first of all their heart and circulatory system; to keep the latter functionating carbonic acid baths supply the best means. Many patients with nephrosclerosis are inclined to gout, which makes the use of alkaline (saline sodium sulphate) advantageous; it will help reduce their weight and will also help the gout.

However, the use of warm, acratothermal baths as well as the use of warm mud baths is contraindicated in spite of gouty symptoms, on account of excessively increased blood pressure. For the same reason bathing places over one thousand meters high should not be recommended to those nephrosclerotic patients.

The nephroses, a designation introduced by Friedrich Mueller for those kidney diseases, in which the glomeruli are less affected, in which, however, the renal epithelium have fallen prey to degenerative changes—have not been studied systematically as yet as to their amenability to balneotherapeutic measures.

We believe that in syphilitic nephroses the use of warm sulphur baths (Aachen, Baden bei Wien, Baden in Switzerland, and others) may aid the effect of the mercurial inunctions, the superfluous mercury on the skin being tied to the sulphur and removed by bathing.

In the socalled lipoid nephrosis—which is a constitutional disease with excessive albuminuria, chlorine sodium retention and edema without increase of blood pressure—F. Munk advocates drinking cures with alkaline, saline iron waters, because most of these patients are debilitated, anemic persons. Iron waters, and arsenated iron waters (Levico, Roncegno, Guberquelle, Dürkheimer Marx Quelle) are certainly used to advantage in these cases.

For all nephroses cases, which exhibit excessive edemas, warm mud baths are worth a trial, on account of their mechanic effect, imitating a slight massage. Mildly purging waters are also recommended for them. If Eppinger's supposition, that in a group of these nephroses the edemas are not primarily due to the kidney lesion, but to a lesion of the subcutaneous tissues should prove correct, the treatment with baths should become quite important.

In the amyloid nephroses as well as in the intoxication nephroses and infection nephroses, balneotherapy has no place.

SUMMARY.

Summarizing briefly balneotherapy in kidney diseases first. Those cases with increased blood pressure and hypertrophy of the heart will be benefitted by carbonic acid baths and drinking cures with cold sodium sulphate waters (alkaline, saline waters); second, patients with chronic nephritis with constant blood pressure increase (even after heart insufficiency has set in) secondary contracted kidney and nephrosclerosis are benefited by a sojourn in the watering places mentioned—provided the circulatory insufficiency has not reached too high a degree; third, chronic nephritis without blood pressure increase is benefited by moderately warm acratothermal baths, moderately warm mud baths and iron baths; fourth, in nephroses, we must gather larger experience; theoretically, balneotherapy in this group of cases will become important.

It goes without saying that the diet and the general way of living must be carefully regulated, beside using the balneotherapeutic means. The bathing places mentioned offer all facilities as to diet and suitable living conditions.

The Law and the Concern of Public Health

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Tradition as handed down from generation to generation of the human family, conveys much medical mysticism from prescientific ages but it remained for this generation to evolve a theory relative to the practice of the healing art that for rareness is causing much concern to the medical profession and to public health authorities.

Before men learned how to harness the powers of Nature, before he could analyze the material forces, man was an emotional being, not a rational one. In olden days when communication was either absent or difficult all about was mystery. Folk lore was believed and no reason was asked. Men were superstitious, fearing the supernatural because not understanding the natural. Evil spirits—demons—bent on doing mischief filled the world so it was thought, to the utter despair, many times, of the sick and suffering.

Sickness in those days was attributed to evil spirits. Cure of illness could only be possible by exorcising the demons through some mysterious power. From time immemorial every rational effort in disease prevention and health protection has been stubbornly and bitterly opposed by those who believed in these mysteries. Termed by arbitrary designation—occultists—from which we derive our term cult as applied to special, particular forms of irregular healing..

Humanity has advanced very slowly and indeed it is well, for slow progress means digestion and assimilation. The conflict between rational progressive medicine and the cults has been in progress for many years and victory for either side is not in sight.

Some persons pretend to possess powers to cure the sick by laying on hands and use the Scriptures to back up their opinions. Others use manipulation, some use adjustments—meaning the change of the position of the bony parts in their several relations, while some even make claim to work miracles —claiming in many instances to do that which medical science considers impossible (curing cases of consumption by manipulation or adjustment, curing advanced cases of cancer deemed by physicians incurable by similar manual treatment, etc.). Some cults even ask that man believe that the miseries do not exist and suggest the thought of such fact is an error of the mind.

Disease and pain are real. As actual as the flowers of the field or the trees of the forest or the streams in the valleys. There is no denying their existence. There may be imaginary or functional derangements or disturbances of one or more of the several organs of the human system, and these may give no physical evidence save that reflected in the imagination. Many nervous derangements exist in the afflicted's mind only—hypochondriasis—but most diseases which destroy life have both objective and subjective physical factors as easily recognizable to the trained eye, ear, or touch as any material fact in nature itself.

Many of these cults—and our use of this term is designative and not in anathema—are not only ignorant of rational or scentific medicine, but many individuals practicing these theories lack the common faculty of applying reason, some are so extreme as actually requiring to be classified as fanatics. Many on the other hand are malicious defrauders, using the cloak of their cult to defraud in order to obtain money under such false pretenses.

The emancipation of man from acquired superstitution regarding ill health is necessarily impeded when all sickness cannot be mastered by the application of known rules of scentific medicine, but this is no fault of the medical science or of the application of the rules by the physician, for it is well known and generally appreciated that disease is in two general grades—the curable and the incurable.

During the world war, when the medical profession was called upon to choose the man power of the country, as well as to save those wounded or about to be exposed to the dangers of environment liable to cause sickness, the cults were not mobilized. These practitioners were conspicuous by their absense. For the purposes of war, it seems, our people are rationalists. Accepting as it were the dictates of medical science as applied to sanitation and hygiene as the safest procedure and most reliable means to safeguard the health of the men of our army.

Unscientific medical cults offered as a substitute for the medical profession in attendance upon the ill regardless of the nature of such maladies are a menace to society. Of this we will go more into detail later on.

It is an admitted fact beyond the question of a doubt that the science of the practice of medicine, even in this most advanced age, is far from perfection, that in many instances it leaves much to be desired, and particularly when it concerns our precious lives, but it must be remembered that the progress of all sciences is slow and medical science is based upon experimentation; oftentimes this takes years and years to establish a single fact, and on this discovery is based the very foundation stones of much of the specific cures of today.

And it is admitted that our specifics are indeed too few. Conditions contrary to these facts are speculative in character and cannot be experimentally established. Speculation demands unlimited faith in the unknown. Are we ready to believe?

Remember, in speculation one must not ask for facts. One must believe unconditionally. To say that all sickness is due to impingement by hard surfaces on soft, and though one cannot prove such by experimentation—either through reproducing, or removal, in several cases—yet to make possible general acceptance of the theory of adjustment we must believe this statement without inquiry or confirmation by others. Such medical philosophy is superficial and primitive, and consequently this appeals to the primitive mind.

So far as we have been able to discover the practice of chiropractic rests on myths, considerable of which has no basis in reality and much of this we are asked to accept is surrounded by suggestions that to the unbeliever appear not only untrue but impossible. It may be that the system is young and that much lies ahead, but it is so contrary to past experiences and so intrenched in the market of money making that it savors of the occult.

Cures by touching or seeing relics, by incantations, by amulets, and fetishes have been from time to time reported in the most serious and sensational way by our public press, and much of this has been handed down to us of today as gospel truth. Epidemics are reported to have been checked by prayer —and while prayer sustains the good—yet prayer has its limitations in the face of sin and suffering, in our opinion, and judging from our experience, only the ignorant and credulous unconditionally accept such uncorroborated statements.

Sanitation and hygiene, the foundation of modern prevention of disease, are based upon solid physical facts that have required literally ages for recognition, and these are, today, our shield and armor against the attacks of disease in many of its forms. Until replaced by something just as good, will have to continue to be our guide towards longer life and better health.

Medical science does not depend upon speculation. Every principle must be demonstrated time and again and must be found true by various observers before it becomes an everyday accepted fact.

The science of anatomy, histology, physiology, pathology, bacteriology, biology and practice of medicine must be studied and the facts of these allied sciences applied in a practical manner to make accurate determination of disease possible. No other way is known. No other way is safe. These sciences must be studied as dry facts because they are solid and to do so requires several years of application for a proper appreciation and understanding. Having acquired these accumulated facts the physician tries to apply them in the light of his understanding, for the benefit of mankind by ameliorating human suffering.

The line, therefore, between rational practice of medicine and the practice of chiropractic of today must be clearly drawn and its boundaries must be respected if society is to be served and sickness cured. Every attempt to trespass upon the field of medicine contains an element of danger which will be detrimental to the wellbeing of modern society. Normal life must be regulated by hygienic rules or else sickness and epidemics will certainly occur.

The practice of medicine according to its accepted science will eventually triumph as it is founded on accepted facts but constant opposition in one form or another delays the final hours of victory.

How is society to be protected against improper medical practice? It is evident to all who think that this problem must be sanely dealt with, without undue force, without arbitrary exhibition of police power, without unpleasant or harsh criticism and without personalities.

Toleration is a safety valve. Our entire democratic structure rests upon this foundation. None other is secure. The doctrines of any group, desiring to practice medicine for gain, must be subjected to the same rules regulating national health as govern the "isms" of any other group of our people. Society cannot force any sick person to submit himself to any definite form of medical treatment, nor is such desirable. The individual with intelligence must be left to his right to choose the healer of his ills as freely as his right to choose his religion. The State, however, in its endeavor to conserve the health of its citizens, has a power and a duty that must not be neglected: it should yield to no vagaries or fanaticisms. The State has control over healers who practice for gain upon its citizens. The highest courts of our country have interpreted our health laws in this respect and are agreed on their constitutionality. The State has a right and should dictate to all who wish to engage in the art of healing for monetary consideration within its boundaries.

To standardize this there is needed a uniform minimum amount of education that will qualify any one for this particular service. All healers, physicians, osteopaths, homeopaths, or others should be primarily trained in the fundamental principles that medical science has taught and clinical experience has thought essential in dealing with the complex problem of disease. No man (or woman) should be permitted to attend the sick unless he (or she) has a fundamental knowledge of the various diseases that may confront him (or her).

To do this there is essential that the individual have a fair education—a common school education, a high school education, a medical education, and, when practical, a hospital or dispensary experience of at least two years—that the public may be assured that there are mental attainments behind the right to practice medicine legally to enable the practitioner to meet the various emergencies one naturally encounters in the field of practice intelligently. Nothing less should be possible of acceptance.

The expectant mother, the infectious, the maimed or crippled, in fact all of the sick naturally and properly demand of the healer that amount of rational medical training which makes it possible for him to know disease. Society demands protection against imitators and irrational healers as strongly as against the ignorant quack or the preying imposter. We must control that medical cult which wants to earn money by a peculiar system, incompatible with the safety of the public health.

A uniform medical training is impossible and all cannot expect a uniform medical practice, but we can exact uniform examination of candidates applying for license to practice the art of healing. As a guarantee of intellectuality this should include all the elementary branches of medicine. There should be no exceptions. We are rationalists in medicine as we are in affairs of business. In health we should not be mystics nor in disease. Carried to the logical conclusion chiropractic is improperly and illegally practiced today in this city, and judging from the several unpleasant experiences—manipulation for appendicitis with rupture and death, adjustment for diphtheria and not reporting these infectious foci, and other conditions—this practice, as here operated by its many untrained and inexperienced votaries, is a menace to our society.

If we are to permit this to continue, chiropractic and similar cults will do away with medical science; it will destroy all medical books; it will close our medical schools; experimentation will cease; laboratories will close; bedside instruction will no longer be needed. We will soon return to the mysteries of the dark ages so far as medicine is concerned.

All we will have to do is to be "adjusted" or deny the very existence of disease. Mankind will have no need for doctors. When war comes there will be no surgeons and when epidemics appear who will succor the afflicted but the undertaker, if there be left such?

These mysterious medical cults are spreading rapidly among the public and unless properly checked will, to the detriment of mankind, lead us away from the path of medical science and back to the superstitions of the long ago when witches held sway and spooks ruled through fear of the unknown.

On the question of proper medical practice there can be no compromise. Chiropractors and other particular cults must qualify on educational standards, before proper educational boards, and be duly registered or else our public health is seriously menaced. As intelligent rational individuals we must study the elements that God has created and make them serve the best interests of mankind.

THE LAW AND THE CHIROPRACTOR.

Scientific medical training is necessary for all who practice the healing art for gain.

Many thousands of remedial agents and procedures are used in the treatment of human disorders and the use of any or all of them are included in the general term "the practice of medicine."

Many patients require surgical treatment, for instance,

1. Wounds with severed arteries, broken bones, malignant tumors (cancer), obstructive tumors (fibroids, laryngeal growths, etc.).

2. Some require the use of drugs—skin rashes, ulcers, intestinal disorders, etc.

3. Some patients require manipulation, lameness, stiffness, sluggishness of circulation, stoutness, paralysis, etc.

4. Patients ill of infectious or communicable diseases require isolation—diphtheria, scarlet fever, smallpox, measles, etc.

In the case of diphtheria the only certain remedy is the specific cure—diphtheria antitoxin—given early and in adequate dose. No other routine treatment as a secondary consideration will be successful in curing the patient. Here to omit the administration of antitoxin and isolation of patient from the remainder of society would be disastrous.

Failure to recognize a case of the communicable diseases and use any form of manipulation as a method of treatment would endanger the entire community.

Again, patients who have taken poison, many accidentally, require the prompt use of antidotes, some of which are powerful drugs and here to substitute some other form of treatment—massage, manipulation, adjustment, prayer, rubbing the spine, or use of fetish, would be futile and the patient would simply die from neglect.

To know what treatment to apply and to avoid dangerous errors scientific training is necessary and essential.

KNOWLEDGE OF THE FUNDAMENTAL SCIENCES ESSENTIAL.

Before any one is competent to play in an orchestra, regardless of the instrument played, one must have a training in the fundamentals of music. This is necessary so that one must not only know when to play but, just as important, must know when he should not play.

A note from any instrument in the wrong place is usually more disastrous than if the player fails to respond when he should. So in medicine, every one treating disease and disorders of the human body by any special method or system of treatment, regardless of what that method is, should have a thorough training in the fundamental medical sciences, anatomy, physiology, histology, pathology, bacteriology, biology and the practice of medicine. So that he may know not only when to use the particular method he is specializing in but also—equally as important, if not more so—when that method should not be used. A wrong treatment may result in the death of the patient or seriously complicate his trouble. To insure efficient care of the sick person, therefore, a scientific education is required.

ESSENTIAL KNOWLEDGE NECESSARY.

Every one who is to practice the art of healing, whether physician, osteopath, Christian science or chiropractor, or other cult or "ism"—and the one who is to use intelligently any certain method or system of healing—needs to have a knowledge of the living body and its many complex normal structures and functions in order to recognize diseases and their causes.

He or she needs to be educated in regard to all the more common diseases, so that he or she may be able to recognize the one he is attempting to treat, otherwise his treatment will be unscientific, hit or miss, shooting in the dark, and dangerous guess work and more likely to do harm than good. Such education is necessary whether drugs are employed or not. No matter what the system or method of treatment may be used this is a fundamental.

Education is necessary in order to be of value in selecting which method of treatment would be most helpful to each particular patient. That which will be of benefit in one malady may have serious or fatal results in another.

In emergency cases, an early recognition of the conditions existing is of vital importance, since failure to promptly apply the right treatment may result in the death of the patient.

One educational standard should be established for all practitioners of the healing art, regardless of the system or method of treatment advocated, and no one should be given the legal right to treat the sick for compensation under any circumstances unless he or she measures up to that standard.

UNIVERSAL MEDICAL REQUIREMENTS.

The following is the minimum standard of education now deemed essential in all civilized countries for practitioners of the healing art, and who do this humane work for the public and for monetary compensation:

1. Completion of secondary school course, equivalent to the fourth year course in the better high schools of this country.

2. Two years' work in a college of liberal arts, including courses in physics, chemistry and biology.

3. Medical training under expert teachers, consisting of a fourth year course in a well equipped medical college, including two years in the laboratories of anatomy, physiology, bacteriology, hygiene, pathology, pharmacology, and physiological chemistry. With two years devoted to the study of patients with all classes of diseases in the dispensary and at the patient's bedside in a hospital.

A SQUARE DEAL FOR ALL.

The minimum training for physicians outlined in paragraphs 1, 2, and 3, is now required by statute in thirty-three states of the United States of America while 1 and 3 are required by all of the states of the union.

If regularly licensed physicians are required to have that essential training, why should it not be required of all others who desire to treat the sick publicly for compensation, and in competition with the highly trained medical practitioner.

All that duly qualified practioners ask for in this instance is an American square deal.

Granted that there is some good—though we are not personally informed of such fact—in the methods of healing employed by chiropractors and others, that good will in no way be diminished if those employing such particular methods are first required to obtain a thorough training in the fundamental medical sciences.

The medical act which governs this matter should require every one who wishes to practice the healing art to show that he or she possesses the proper education—the proper moral qualities, and having demonstrated before a duly authorized body—preferably our educational authorities—then grant to such applicant when he or she qualifies a license as a physician and let him or her use any method of treatment which he or she in his or her judgment and according to his or her educated common sense knows is suitable and proper for the patient.

Let all others violating this act and menacing the health of the public, either as individual or as a group, or as teachers in an improper school be brought before the bar of justice and so punished as to deter any contemplating violation of the statute. Let this justice be swift and certain.

There are some persons who think or imagine that the profession of medicine operate a gigantic monopoly of the practice of healing. It is not so. The practice of healing is governed by statute and under supervision of public officials of the forty-eight states. This in the interest of individual welfare and better public health.

Drug Addicts on Riker's Island

By JAMES A. HAMILTON, Ph.D.,
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On Riker's Island is located the prison hospital for the treatment of drug addiction in males. Dr. Stewart N. MacVean, the resident physician, is directly responsible to Dr. John M. O'Connor, medical director of the Department of Correction, who has outlined the treatment. Our wide experience in the handling of drug addicts and our painstaking study of these individuals have developed a well defined and definite policy for their care. This plan hinges on our conception of the medical and economic status of a drug addict.

All students of drug addiction are grouped into two schools: First, those who believe drug addiction to be a disease and those who believe with us that it is merely a pernicious habit. The laity have criticized the medical profession for their failure to produce a real cure (as they term it) for drug addiction. This criticism has resulted from a misconception of drug addiction and also from the use of the word cure, which is undoubtedly a misnomer and gives an erroneous impression.

If we regard drug addiction as a disease we must not expect the cure to produce any immunity to a recurrence. There are only a few diseases that produce any immunity and this immunity is but relative, never absolute. In a great many diseases one attack predisposes to a recurrence. If we regard drug addiction as a disease it is among those where a recurrence is possible that we must place drug addiction. If, however, we regard it as a pernicious habit and not a disease then we must expect, all the more, that there will be constant recurrence so long as these individuals continue to make self-indulgence the feature of their lives.

There has been much discussion as to grouping or classification of drug addicts themselves and much has been written about the socalled respectable drug addict. All drug addicts in our institutions are sentenced for some crime or misdemeanor, generally as vagrants. This brings to our mind a feature in the treatment of drug addiction that has been frequently overlooked and that is the custodial care of these individuals. All drug addicts are potential criminals. The lack of criminal acts in the socalled respectable drug addict results from his ability to obtain the drug. Let him be deprived of the drug by lack of funds or opportunity and you will find the criminal who will stop at nothing to obtain his supply.

Justice Cornelius Collins of the Court of Special Sessions, at a meeting of public spirited citizens interested in drug addiction, very pointedly and correctly remarked that a drug addict is not a free agent and went on to describe some of the atrocious crimes that drug addicts are liable to commit while under the influence of the drug.

We heartedly agree with Justice Collins' remarks and place drug addiction as one of the greatest public menaces of today. It is quite evident if a drug addict is not a free agent that there must be custodial care in the handling of drug addicts. This is a very important feature that will be gone into when we discuss the treatment of drug addiction. We feel that a drug addict is much the same in prison as out of prison. They are all the same wherever you find them. When they are being taken off the drug they are mean, contemptible, selfish, and as arrogant as conditions both inside and outside the institutions will permit them to be. While they are entitled to a certain amount of sympathy on account of their pitiable condition it is a decided mistake to make heroes out of drug addicts. Sentimentalists and those who are continually preaching "the poor drug addict" have developed and fostered an arrogance in these drug addicts that is unbelievable to any but those who have had them in care. The past few years have been fruitful in determining what the true status of the drug addict is. Years ago the treatment was undoubtedly brutal. Investigations swung the pendulum too far on the other side and developed for the drug addict a sympathy far beyond what he deserved and which was not at all conducive to his real welfare.

CUSTODIAL CARE

The medical mind knows no social distinction. The real physician ministers to rich and poor alike, and his best efforts are given to the criminal as well as to the law abiding citizens, so that the real classification of drug addicts as the medical man sees it, is a division into those who are willing to cooperate and those who are not.

Rarely indeed do we find a drug addict whose desire to be relieved of his drug addiction is based on any of the finer motives. The constant use of drugs, the selfindulgence, the repetition of acts which he knows are harmful to himself, physically and mentally, attacks first the will; later the whole moral fibre is injured, and if not entirely destroyed, he may present himself later for treatment in the group of those who are willing to cooperate. This group, our experience has shown, consists of:

1. Those who take treatment for fear of being abandoned by relatives or friends; a wife threatens to leave her husband unless he "takes a cure"; or a father will disinherit a son if he does not enter a sanitarium.

2. Those who, having reached the stage where they are taking large doses, find it a very expensive habit and take the treatment so they can start again on small doses.

3. Those who, although able to pay for the large doses, do not get the desired effect. The drug addicts inform us that when they have gradually increased the dose there is a limit reached when they do not get the desired effect. These addicts take the treatment so they can get the exhilarating feeling of the early stages of drug addiction.

Cooperation based on so flimsy a foundation is bound to fail, and their willingness to see the thing through deserts them with the first withdrawal pain. Now comes the scheming to get the drug. They seem to be pathological liars. They complain that the dose given them is not the required strength, insisting that the nurse giving the "shot" used a leaky syringe. They will not hesitate to try to steal the bottle containing the morphine and take out a quantity and dilute the remainder, with no regard for the other drug addicts, so long as they themselves are possessed of sufficient. If all their scheming fails, they then resort to the underworld for their supply.

It is sufficient to ask any former drug addict if he believes in the ambulatory treatment of drug addiction to convince yourself of the necessity for custodial control of these people. It is therefore useless for a physician to attempt to relieve a person suffering from drug addiction when he realizes that at the first sign of discomfort his patient is going to desert him and refuse to continue to be treated.

The treatment of drug addiction without custodial care is ineffective and to those who have handled large numbers of drug addicts, the idea is amateurish or shows insincerity.

Even under custodial care the two great divisions of drug addicts merge into one—the unwilling—as soon as treatment is fairly started and as they are timid or bold by nature we find all the gradations from mere reluctance to cooperate to rebellion. When they realize that the doctors and custodial officers are serious and are not to be wheedled by coaxing, bribes, or threats to continue them on the drug, they start letter writing. Public officials are fairly bombarded by letters from these drug addicts complaining of the brutal, inhumane treatment they are supposed to be receiving.

Letters to the daily papers start a propaganda that develops a sympathy in the public mind that really works to the detriment of the drug addict. Backed by erroneous public sympathy these drug addicts grow bolder, defiant, and arrogant, and at times riot in the hope of drawing public attention to themselves and through the sympathy aroused find some means of compelling those in charge to give them the drug.

It is interesting to be behind the scenes in a drug addict ward and watch them unobserved while they are rioting. If no attention is paid to them, those who are complaining that they cannot sleep, go to bed; if they hear footsteps outside the ward, the ringleaders wake up all the patients who "could not sleep," so that all will join in the appeal for more drug. When the ringleaders are taken out of the ward and placed in separate rooms, everybody goes to sleep.

The staging of "fits of all kinds" by the drug addicts when official visitors are present is of frequent occurrence. It is not uncommon for a drug addict to simulate a state of collapse in court, although they received the drug in sufficient amount from the authorities. A very zealous citizen seeing a performance of this kind requested and received permission to visit the Correction Hospital, as she was sure this inmate would be dead before she reached there. Imagine her surprise to find the patient walking around the ward as though nothing had happened.

The general hospitals of the city showed their evidence of a humane and kindly interest by opening their doors to the drug addict. The scheme to treat them in institutions other than penal failed, not on account of the treatment, but due to the fact that there was lack of custodial control. Hospital superintendents reported that these patients expectorated on the floors, broke the windows, violated all the rules, would not clean themselves or allow anyone else to clean them, insulted and abused the nurses so that they refused to stay, and endeavored to bribe all with whom they came in contact; in fact, completely demoralized the entire corps of attendants and made a veritable bedlam of the hospital.

It is not surprising that the doctors should have asked for the cooperation and collaboration of the custodial officers in outlining our treatment. The policy in treatment has, however, been dictated by the medical bureau and they have not been interfered with by anyone outside of their own profession. The medical policy of the department is not antimedical, but does show a proper appreciation of both the medical and custodial features.

We believe that drug addiction is a most pernicious, degrading, and degenerating practice. It is to all intents and purposes a habit. There is no known pathological entity produced by drug addiction. We believe that the symptoms produced are the result of the inhibitory action of opium and its derivatives on the vital functions of the body. We believe that the withdrawal signs are due to a too rapid return of the functioning of the different organs after having been locked up either partly or completely by the use of the drug. Our efforts then in the treatment is to bring about a more gradual resumption of the functions of these organs to meet the symptoms when they appear and to relieve any suffering by appropriate medicaments, to rehabilitate them physically by wholesome food in sufficient quantities and by graded exercises to bring back their muscular tone and to induce sleep and mental rest by diverting their minds.

Riker's Island, therefore, is essentially a hospital. Custodial officers are present to enforce order and discipline and to carry out the policy of the treatment that is dictated by the medical board in cooperation with the warden.

It has been suggested that at Riker's Island some sort of educational program be instituted for the inmates there. We believe that this is contraindicated. The length of stay of our drug addicts has been determined by the physicians. Should their stay be ever lengthened beyond what the doctors feel is required to put them in good physical condition, a correctional program would then be considered. At present the medical feature is the prime consideration.

All drug addicts received in our institutions are committed there for a crime. Much has been written about the socalled respectable drug addict. The experiences of our general hospitals have led us to question whether there is such a thing as a respectable drug addict. Realizing that drug addiction is a menace to the community and that it is a degrading habit, degenerating a person mentally, morally, and physically, these individuals if they persist in this habit when the cure is so easily obtained are certainly by continuing, not only their own destruction, but by the bad example that they give, make themselves highly undesirable citizens.

The aim of all treatments is to take the patient "off the drug" and to keep him off until there is no physical craving and to place the individual in as near a perfect physical condition as possible. The treatment must be carried on in as humane a manner as possible.

In the consideration of the different treatments with a view to selecting the one most adaptable, we must consider, first, safety; second, the most humane method, and third, the most economical treatment. All the different treatments have been used in the correction hospitals.

First, its safety.—There have been no deaths in the many thousands of cases treated with the withdrawal plan. Other treatments have had fatalities owing to the risk incurred by using potent drugs.

Second, the humane side.—All treatments are attended with suffering, generally for seventy-two hours. There are pains, colicky in nature, and mental anguish. Our patients who have taken both treatments prefer the withdrawal plan.

Third, economy.—The treatment which substitutes some potent drug for the morphine, or other opium derivatives, must necessarily employ a large staff of specially trained attendants, doctors and nurses, as the patient must be continually watched while under the influence of this substitute drug.

After using all the different methods we have finally realized that the safest and most economical plan, which at the same time is as humane as the others, is the gradual withdrawal treatment.

Uncomplicated cases of drug addiction are simple to treat. It is necessary, however, that a drug addiction hospital must have in conjunction a complete surgical division with an operating room, and all the facilities for the surgical care of these individuals. In fact, the care of drug addiction must take into consideration the treatment of its complications. Women whose pelvic conditions give rise to painful menstruation are liable to become drug addicts, and if the habit is contracted it is useless to treat the drug addiction unless the pelvic condition is also remedied.

We have frequently been asked when the general physical examination of the drug addict should be made—before or after—the active treatment has been completed.

On entrance the patient should be divested of all his clothing and careful search made for anything that needs immediate or emergency treatment. Those having venereal or other infectious disease should be isolated. Those who are frankly tuberculous should be sent to the tuberculosis division, and there watched carefully during the withdrawal to note if he can be safely relieved of the drug or not. In cases where tuberculosis is suspected the patients should be carefully examined daily, as it is almost impossible to make a differential diagnosis between drug addiction and incipient tuberculosis in the very early stage. As a rule the drug addiction masks the symptoms of underlying medical or surgical conditions and it is therefore necessary to take the patient completely off the drug before we are able to determine his real condition.

Lately it has been suggested that a congressional investigation of the entire subject of drug addiction be made with a view to determining what treatment is the best. All debates or discussions relative to the control of drug addiction sooner or later become acrimonious disputes between medical men as to the merits of their respective treatments. In this way the doctors have unintentionally befuddled the real issue, which is not treatment but the *prevention of drug addiction.* Treating drug addicts bears the same relation to the broad problem of drug addiction as the treatment of drunkenness bears to the broad problem of inebriety. Men were formerly treated again and again for drunkenness, and at the time no one believed there was any permanency in the cure. Everyone expected there would be a relapse. Treating drug addicts is a very small item when it comes to the real problem.

Drug addiction will never be eradicated by treatment. Prevent the drug addict from getting supplies and there will be no necessity to worry about what kind of treatment is the proper one. The Department of Correction stands firmly and squarely on the assumption that all drug addicts are a menace to the community, and to be taken off the drug they need custodial care.

It would be interesting, of course, to have a nonpartisan and fair review of the treatment and handling of drug addiction; but the interest probably would be more from a medical viewpoint. The importance of the treatment is far outshadowed, however, by the larger problem of how to prevent drug addiction, and how to prevent the drug addict from obtaining the drug.

In 1921 the Municipal Farm, Riker's Island, received and treated 2,197 drug addicts.

Editorial Articles

PURIFICATION.

A new David has come to be. Discarding the ancient sling shot, our hero uses the most modern of weapons—the pen. His writings have stirred the world and, in order to save what we can of our fast thinning ranks, it behooves us to read and take heed; for the vicious giant who has received the attack is the physician of today.

He has shown how the medical profession is made up mostly of fools and that they gain their fabulous fees by exploiting greater fools and—more the pity—the ill and disabled. Not all physicians are fools; many are knaves and charlatans, a very few are fine, upstanding fellows. If we only had the honesty and fearlessness of this widely known author! His writings and photograph appear in *Hearst's International* and, fortunately for posterity, the gist of his monumental work has been preserved in book form, *Our Medicine Men* (The Century Company, 1922). The man who has written these brilliant essays, a name future generations will come to venerate, is Paul H. DeKruif.

We can only comment briefly upon the scholarly works of DeKruif. How it was possible for one man in a single lifetime to marshal the vast amount of material he presents is beyond comprehension. He takes up the study of medical practice from antiquity until the present day. His only desire is "to inquire into the causes for its present extraordinary magnificence and prosperity, and to discover, if possible, whether these are due to a commensurate increase in the value of its service." He shows that feeble attacks have been made against medicine by Butler, Moliere, Da Vinci, and Shaw; but these failed. But he will succeed. Paracelsus, Galen, and a host of other fathers of medicine are portrayed in all their ignominy. The rank and file of medical men today are no better than those who followed Galen; therefore quackery and fakery abound. (Any student of logic will be able to explain this to the ordinary, illiterate physician.)

DeKruif has gone through all there is in medicine with judicious wisdom, separating the good from the bad and throwing most of it into limbo. Little is left. Vaccines, group medicine, psychoanalysis, specialists, medical colleges, these and many others are dissected without mercy, and we are shown with startling clarity that it is all a sham and worthless, utterly worthless.

Gone, forever gone, are the days of the good old family doctor. Here we find the only note which approaches any pity for the heartless tribe of medical men. It is high time this group of rascals were exposed, vendors of nostrums, fee splitters, cunning aids of heartless drug houses, pretending to cure while injecting vaccines and gloating over the bodies of their slain victims, not forgetting to send bills for fabulous sums to the relatives of the departed. Could a more heartbreaking picture be painted? Could anything be so monstrous?

A few excerpts just to show how keenly this work is portrayed. "The American, generally deficient in thorough education and sound culture, is more naive than his European brother. . . . So is the American doctor who presents the best demonstration of this attempt of physicians to replace their priestly dignity by questionable claims to residence on the austere heights of science." You may well hang your heads in shame, American physicians. Repent before it is too late. The warning has been sounded by DeKruif.

Freud comes in for his share. "Freud, using the methods of psychoanalysis, invented by Kraeplin, has propounded windy theories on the nature of hysteria." Won't Kraeplin be angry when he reads this? Over thirty years have elapsed since this most talked of doctrine of Freud's has been formulated and DeKruif through his superhuman deductions has managed to trace Freud to his lair—Kraeplin. This is a real contribution. He goes on ripping the doctrine to shreds. "The champions of Freud gravely announce themselves to be psychologists though they know nothing of the quantitative science on which the small body of really valuable experimental mental science actually rests. . . . And the small amount of fact upon which the doctrine rests has doubtless been known for many years to alienists or even ordinary physicians."

With all this the real value of DeKruif would be limited, though extremely valuable. He has the remedy—the antiphysician. The duties of this functionary would be to advise all prospective patients as to the doctors it would be wise to avoid. "The requirements for office would not be based on college degrees. . . . For it is notoriously true that the higher education in America increases credulity and dims judgment. The antiphysician would be chosen from the ranks of the incredulous, the cynical. . . . His metier might have been that of the peasant, the joiner, the stonemason, the saloon keeper."

We nominate DeKruif for Master of the Honorable Order of the Antiphysician.

THE TREATMENT OF WOUND INFECTION.

The treatment of infected wounds, particularly those of warfare, has resulted in the production of innumerable publications on the subject. The bacteriology of wounds of warfare and the comparative value of antisepsis have given rise to some remarkable studies. It has now been proved beyond any doubt that after the introduction of septic foreign bodies, carried into the wound by the projectile—particularly bits of clothing and soil—bacteria rarely develop before a lapse of eight days, and that wounds have a tendency to become spontaneously sterile. The traumatized tissues will be found to be undergoing proteolysis and an autovaccination due to the antibacterial power of the tissues and phagectosis. Finally, there is a microbic inter-reaction, certain bacteria having a favorable action on the pathogenic germs, others just the contrary. Consequently treatment should at the same time favor tissue repair and combat the infection which will inevitably have developed in the wound.

The repair of the wound is—in the naturally septic conditions of war surgery—determined by the infection present, as well as by the generalized infection which is the natural result. It is therefore clear that, above all else, the infection must first be dealt with; the wound must be freely incised; all damaged and dead tissue must be excised; conditions must be so changed as to meet requirements for wound repair and for reconstruction. The insufficiency of antiseptics—iodine, oxygenated water, sublimate—to prevent septic accidents was demonstrated in the early days of the war, in 1914. The results of aseptic surgery proved conclusively that the proper treatment consisted in the early excision of traumatized tissue and free exposure of the wound.

The ideal therapeutic method is the one which promotes by every available agency the normal means of defense of the organism. Delbet and Fiessinger advise the exclusive use of solutions capable of favoring the natural defensive functions of the economy, to increase phagocytosis and accelerate repair, their action on the bacteria in the wound being only indirect. Wright's hypertonic solutions have an osmotic action which sets up an excitation of the bactericidal substances. The magnesium chloride solution at 10 to 1,000 (Delbet), without any direct bactericidal action, distinctly increases phagocytosis, favors cell proliferation and the cicatrization of the wound. Heliotherapy provokes especially an intense reaction in the wound; its rôle appears to be due rather more to tissue reaction than to a local batericidal action.

What is really needed are antiseptics mildly toxic for the tissues and very toxic for bacteria and interesting researches have been made in this direction The Germans during the war used the derivatives of quinin and ethyl hydrocuprein (optochin) which had been formerly recommended by Morgenroth for pneumococcal infections. Dakin and Dunham studied bacteriologically a series of antiseptics, particularly the chlorated and their organic combinations, for example with the amino-acids, the chloramines and dichloramines, mildly toxic substances, giving rise to little irritation, giving off their chlorine slowly which acts in the nascent state. In wounds they have a progressively important antiseptic action.

The phenolic and naphtholic antiseptics have been used by Carnot in burns, after incorporating them in a mixture of wax and paraffin. As far as ionization of metallic antiseptics is concerned it is admitted that the metallic ions present in the watery solution and derived from the electrolytic dissociation in the solution, are the principal disinfectants. The dye products, such as flavine, have been experimented with; the latter was largely used in the British army in a 1 to 1,000 solution with apparent success. Finally, Carnot and Dumont have shown that the addition of acids considerably increase the penetrating power of antiseptics, a fact which is the starting point of experiments at present under way.

On account of the preponderating importance of the streptococcus in wound infection antistreptococcal vaccination and serotherapy have been fruitlessly essayed. On the other hand, vaccines and sera have been prepared to deal with all the series of anaerobic bacteria producing gas and in certain cases the sera of Weinberg, Sacquipée, and Vincent have given conclusive results. The polyvalent serum of Vallé and Leclainche—streptococcus, staphylococcus, pyocyanic, anaerobes—either as preventive infections or applied on dressing locally, has also given some interesting results.

The first really great successes were obtained after early cleansing by copious and frequent irrigations with chlorated fluids—Labarraque's and Dakin's—and perhaps the most important—Carrel's solution. Carrel followed with the microscope the bacterial development in wounds, demonstrated the progressive disappearance of the pathogenic germs and the possibility of secondary suture when the wound had become aseptic.

Eventually it was found that antiseptic solutions only played a secondary part in these results, the principal rôle being attributed to thorough excision and exposure of the wound by free incision, so that now the majority of surgeons are convinced that antiseptics are useless in controlling bacterial development, that the action of antiseptics is detrimental rather than useful in the treatment of wounds, and that they should be proscribed without reserve.

VARIATIONS IN THE ELEMENTS OF THE BLOOD SERUM IN CERTAIN PATHOLOGICAL STATES

The total nitrogen—albuminoid nitrogen plus the total residual nitrogen—is normal in azotemic subjects; in tuberculous patients, on the contrary, the total nitrogen is considerably increased in the blood serum. The average obtained by Maguin showed that a hyperazoturia of more than two grams a litre existed and, consequently, may indicate the origin of the phenomena of denutrition and autophagism presented by these patients.

In subjects showing great losses in albumin, with edema and chloride retention, the search for the total nitrogen gave exceptionally low figures in Maguin's researches, namely, six grams, eighty-five centigrams to the litre, and he is of the opinion that, in the presence of such notable decrease in regard to the average normal amount, the loss of albumin plays an important part in the phenomenon of dilution of the blood.

The value of urea nitrogen is low in tuberculous and diabetic subjects as is also the value of the total residual nitrogen in these patients. The ratio of total residual nitrogen to the total nitrogen is greatly increased, namely, from 2.43 in normal to 6.12 in azotemic cases. It is very low in tuberculous cases and in diabetics, being respectively 1.74 and 1.85. The ratio of urea nitrogen to total nitrogen varies in the same way.

In conformity with the conclusions of Widal's work, Maguin found the ratio of urea nitrogen to the total residual nitrogen to be greatly increased in azotemic subjects, its average value having been found by this observer to be 86.5, while in some instances the value of the ratio was considerably more than this average.

The index $\frac{\text{N albuminoid}}{\text{N urea}}$, which in normal individuals is about 74, drops in azotemic subjects; it averaged 21 in Maguin's cases, and on the contrary, he found that it went up considerably in tuberculous and diabetic subjects, being respectively 163 and 184.7. The residual nitrogen (in the strict meaning of the term—namely, the total residual nitrogen), urea nitrogen, varied in minute proportions, although the syndromes were quite different—renal, tuberculous and diabetic patients. Its exact determination, interest in which has recently been shown, appears difficult of accomplishment on account of the lack of precision afforded the present technic.

The manner of precipitation of the albumins is of prime importance in the research for the total residual nitrogen. Alcohol ether has seemed to Maguin the best precipitant, the surest and most practical. The doses of the total residual nitrogen in the filtrate of precipitates with alcohol ether and trichloracetic acid always showed differences of more than six centigrams in excess of those with trichloracetic acid. The doses with the metaphosphate, on the other hand, offered little difference from that obtained with the alcohol ether procedure.

In chloruremic nephritic patients the blood concentration appeared very low. On account of retention of the chlorides there is edema and hydremia. It would appear, however, that when these patients eliminate large amounts of albumin, this factor should be taken into serious consideration in explaining the low blood concentration.

Besides dilution of the blood from an increase in the fluid mass, it seems not improbable that dilution of the blood from disappearance of the albuminoid molecules may result and, in support of this theory, it may be remarked that in the many cases studied by Maguin the urea content of the blood of chloruremic patients did not appear to be sensibly decreased, as might have been the case in an exclusively aqueous dilution of the blood.

The serum of tuberculous patients, as also in diabetics, was found richer in proteid matter than that of normal individuals. Radioactive emanations appeared to provoke a hyperalbuminosis in the blood serum in a patient on whom this experiment was made.

X RAYS IN DIAGNOSIS.

Röntgen ray pictures of the chest art, to the uninitiated, the most alarming case data which we possess, and the contemplation of the report from the x ray man as to his findings would, without conference with the maker of the picture stimulate the imagination to the point of "giving" to his patient some serious chronic, if not acute, disease. The reply to our inquiry for more definite diagnosis usually is, "It all depends on the clinical findings."

Perhaps the x ray operator may condescend to go further and say, "My dear sir, you must remember that lungs have been through many battles and show, in the average case, the scars of bronchitis, whooping cough, old tubercular processes, and even colds. You must expect to find all sorts of pictures and none of them strictly normal." And we can only whisper to ourselves, "We might have known as much."

The chest of the child over three years of age already shows signs of the battles that have gone on within, and the pictures vary with the experiences of the individual. Pancoast, Dunham, and Baetzer have recently given a description of the x ray findings in the normal chest of the child. Among other features which might alarm the uninstructed, calcified nodes at the root of the lung are of no significance unless accompanied by evidence of lung disease, and are of interest only as possible evidence of some healed lesion which may or may not be tuberculous. They are common findings. Shadows out of the usual shown elsewhere may accompany a tubercular process, but may arise from some other cause. Nor can active processes be distinguished from quiescent conditions.

As in so many other laboratory tests we are thrown back to physical examinations by older means. The x ray picture, except in very marked cases, give us no evidence which stands by itself. The use of our trained senses cannot yet be displaced by machine methods.

If x ray pictures of the chest must be taken with considerable salt, so must they elsewhere, and even where the penetrating tissues are so thin as in the jaw. The number of perfectly good teeth which have been extracted because "the x ray showed an abscess" is something appalling to contemplate. The more experienced the x ray man is, the less he sees in a picture, or should we say the more he does not see. At any rate, the less positive he is in making a diagnosis from what he sees.

THE SYMPATHETIC ALGIAS.

Causalgia, first described by Weir Mitchell, develops a few days or weeks after injury—even slight—to a nerve trunk. The evolution is progressive and the pain experienced attains remarkable intensity. Examination reveals neither paralysis nor anesthesia, but a surface hyperesthesia exists, while deep pressure is not especially painful. The electrical reactions show little or no change. On the other hand, vasomotor disturbances are pronounced; the skin is thin, smooth, red and hot and covered with sweat. The cutaneous furrows disappear, the fingers become slender, the nails incurved and stiffness of the joints rapidly ensues. Occasionally, on the contrary, the skin is cold, white, dry and scaly and these types are the result of deeper seated nerve lesions with neuritis and paralysis. All the mixed and sensitive nerves may be the seat of this morbid process, but the median and internal popliteal nerves are the most frequently involved, after which come the ulnar and sciatic. The other large nerve trunks are exceptionally the seat of the trouble.

The evolution of causalgia cannot be foreseen. In some cases recovery takes place in a few weeks or months; others persist for years. The involved nerve usually presents slight lesions, exceptionally a small neuroma may be found. Frequently the nerve merely shows contusions and congestion, and this disproportion between the violence of the pain and the insignificance of the lesions has led one to suspect that the sympathetic nerve is the cause of these paradoxical disturbances.

As Tinel has pointed out, it is evident that the causalgic pain presents a special type. The sensation of burning, acute tingling, of plenitude with arterial pulsation, sedation by the use of cold water locally applied, the emotional provocation of the paroxysms, the intensity of the vasomotor disturbances, profuse sweating, hyperemia and extreme vasodilatation are of undeniable sympathetic and essentially vasomotor nature. The nerves most usually involved are richly supplied with sympathetic fibres. Synesthesialgia is frequent. The distant territories in which causalgic pain can be produced have an almost fixed systematization in each individual case; they are causalgic areas having a more or less radicular topography and extend or decrease in surface following or the progression or attenuation of the painful phenomena. Finally, the often paradoxical results derived from certain surgical interference also seem to demonstrate the sympathetic origin of the accidents.

In a large number of cases of causalgia recovery occurs spontaneously. In many others, the patients are improved or cured by very light massage, continued positive galvanization, high frequency current, and radiotherapy. The persistant tenacious forms of the affection are prone to occur in predisposed individuals, having constitutionally an abnormal degree of excitability of the sympathetic. They are depressed neuropaths, very emotional, always the prey to perpetual uneasiness for which isolation and silence are necessary. Hence for them, psychotherapy plays a large part in their recovery. In not a few instances interstitial injections of the nerve with alcohol at 65° have given excellent results.

Various surgical interferences are successful, all the more so when resorted to soon after the onset of the causalgia. But it must be admitted that the results are not constant. Perivascular sympathiotomy—denudation of the femoral, popliteal or brachial arteries—has occasionally given marked results, at other times they were incomplete or transitory, Tinel has divided the nerve or injected alcohol in the nerves or their branches below the lesion near their termination. A simple injection of cocaine in the nerve has resulted in a cure of several cases of causalgia of medium intensity and of recent date. In a case which resisted every kind of treatment, Sicard and Robineau obtained a cure by intraspinal division of the sacral roots.

The knowledge of these sympathetic disturbances has resulted in attributing the same origin to certain spontaneous or provoked algias of the limbs, trunk, perineum or face developing without any apparent cause or following some very minute trauma. These various disturbances which have been regarded as neuropathic belong to disturbances of the sympathetic from the very nature of their symptomatology. Acroparesthesia and certain cenestopathies appear to belong to the same category of cases.

Hence it would seem that in certain circumstances and in some predisposed subjects a localized sympathetic hyperexcitability may develop, often with a tendency to extend, the result of some special peripheral irritation, an erethism of certain corresponding sympathetic centres similar to those of causalgia resulting from a wound of a nerve trunk. In these cases the iodides, trinitrin or sodium nitrate will occasionally give good results, but rest and psychotherapy must never be neglected in the treatment.

IS IT MISPLACED?

Perhaps in no one medical (or surgical) opinion has there come about, or at least begun, so radical a change as in the attitude toward the significance of a socalled misplaced or misshapen uterus. It is most fortunate for the female that such a mental transformation is under way, for she has suffered all too much from misguided, if well meant, diagnosis and from useless, if harmless, treatment.

The searching of case records of late by clinicians has brought out pretty certainly that retroposition and retroflexion of the uterus which were lately blamed for most of the ills from which women suffer are present in a large percentage of the unmarried with dysmenorrhea, but backache, and other symptoms are but slightly, if any, more frequent in these than in other women. In married women the backward position of the uterus is even more frequent, but, again, this seems (in uncomplicated cases) to have little or nothing to do with symptoms or even with sterility. One observer remarks that "pelvic complaints are engendered by suggestion," and by the mere mention by the physician (for no one else can make the suggestion) that there is such an abnormality, "the displaced uterus becomes a pain pathway for neurosis."

The matter of traumatic displacements of the uterus has been reviewed by Moch who concludes that "uterine displacements are never due to trauma *per se*." Yet it has not been long since we were taught that the mere climbing of a flight or two of steps was liable to unbalance the position of the organ and, consequently, endanger the health of its possessor for all time.

A brighter day will dawn for women when, in the words of Cabot, it is generally understood that "There is no right position of the uterus. We used to teach that it ought to be slung forward and upright, and if it was not in that position it was not right. But, in fact, it may tip forward, it may be straight up and down, or it may be turned clear back, and yet be perfectly normal. The best knowledge of today recognizes no single right position of the uterus."

Now that the position of the womb cannot conscientiously be blamed for many symptoms, attention can be turned to the real causes of backache, dysmenorrhea, etc., and these will probably be not far to seek in the general faults of hygiene, in constipation and its causes, lack of active exercise and faulty diet, in foot-deforming, muscle straining, exercise forbidding foot wear, etc. It is vastly simpler to operate, as it is to prescribe pills, but for such ills there must be treatment which leads to more thoroughgoing physiological results.

INDUSTRIAL ACCIDENTS.

A recent issue of the *Statistical Bulletin of the Metropolitan Life Insurance Company* contains a study of the number and causes of fatal occupational accidents as compared with nonindustrial accidents during the nine years from 1911 to 1920 inclusive. The study covers the accidents suffered by the white male policyholders of the company, aged fifteen to seventy-four years. In the nine year period there was a total of 27,074 deaths from all kinds of accidents, 7,835 of which were due to occupation, or twenty-nine per cent. of the whole, or a rate for the nine years of 35.5 per hundred thousand. In 1913 the highest prewar rate, 45.7, was recorded, and in 1915 the lowest rate, 27.5. This improvement was doubtless due to the safety movement resulting from the enactment of workmen's compensation laws, but the gains were soon offset by the great and rapidly increased industrial activities induced by the war. In 1918 the industrial accident death rate had grown to 40.9, an increase of nearly fifty per cent. in three years. In 1919 the rate dropped to 32.1, but in 1920 rose again to 34.9. There is great variety in the proportions of occupational causes of death. Traumatism in mines and quarries gave the highest percentage, ninety-three. Injuries by machines were responsible for eighty per cent. Electricity, exclusive of lightning, caused sixty-eight per cent. of the deaths. Fractures, accidental drowning, and deleterious gases were causes giving, in the order named, the lowest percentages.

NEW PRIVATE HOSPITALS.

New York City will have in the near future two new private hospitals, one of which will be the largest institution of the kind in the country. The latter will be located on the southeast corner of Fifth Avenue and 103rd Street, its cost is estimated at about one million five hundred thousand dollars. The plans provide for a nine story fireproof structure of the modern hotel type, equipped with all the latest scientific apparatus and furnishings known to modern medicine, and supplied with all the conveniences and luxuries suitable to a modern private hospital. The building syndicate will be incorporated under the name of The Physicians' Medical Hotel Company.

The other hospital is to be erected on the northwest corner of West End Avenue and Seventy-second Street by a syndicate of New York surgeons and physicians. It will be a twenty-two story building costing probably three million dollars. The capacity will be four hundred private rooms and ten operating rooms, besides the other rooms necessary to such an institution.

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News Items.

Annual Meeting of the New York Neurological Society.—The annual meeting of the New York Neurological Society for the election of officers will take place on January 2, 1923.

American Gynecological Society.—At a recent meeting of the American Gynecological Society it was voted to hold the annual meeting of the society in Hot Springs, Va., May 21, 22, and 23, 1923.

Bequest to Medical School.—Marquette University Medical School will receive approximately one million dollars under the will of Mrs. Harriet L. Cramer, widow of the late owner of the *Evening Wisconsin.*

International Congress of the History of Medicine.—At the third international congress of the history of medicine, held in London in July, it was decided to hold the next congress in Geneva, Switzerland. The first congress was held in Antwerp and the second in Paris.

Enforcing Vaccination.—The Supreme Court of the United States has ruled that municipal ordinances authorizing boards of health to enforce vaccination against smallpox and to take other precautions to prevent epidemics are valid in the case of Rosalyn Zucht against the city of San Antonio, Tex. The plaintiff contended that although state legislatures might confer such power, municipalities might **not.**

Assistants in Ophthalmology.—The Italian Medical Society of New York has been notified by the department of ophthalmology of the University of Rome, that two assistantships without salary are offered to American medical graduates of Italian extraction. Living expenses will be paid. For further information application should be made to the Societa Medica Italiana, 47 West Forty-second Street, New York City.

Convention of the Radiological Society of North America.—At Detroit, from December 4 to December 8th inclusive, the Radiological Society of North America held its annual convention. Most of the discussions during the convention centered about the increased use of the x ray and the further development of that science. Among the speakers were Dr. A. J. Oschner, of Chicago; Dr. R. D. Carmon, of Rochester, Minn., and Dr. W. L. Coolidge, inventor of the hot cathode x ray tube, known universally as the Coolidge tube.

New Wing for Beth Abraham Home for Incurables.—Impressive ceremonies marked the breaking of ground for the new wing of the Beth Abraham Home for Incurables at 612 Allerton Avenue. The home was established somewhat more than two years ago and has already become an important institution in philanthropic activities. At present it institution in philanthropic activities.

Bequest to Pennsylvania University for a Department of Clinical Surgery.—Under the terms of a bequest made by Edmund A. W. Hunter, the University of Pennsylvania will receive $200,000 for the establishment of clinical surgery. The bequest was made with the provision that the addition to the university be known as "the Agnew and Hunter Department of Clinical Surgery" in momery of Dr. D. Hayes Agnew and Dr. Charles D. Hunter, the son of the donor.

Director of Occupational Therapy.—The State Hospital Commission has announced the appointment of Mrs. Eleanor Clark Slagle as Director of Occupational Therapy for the State hospital system. The initial task for the new appointee will be a general survey of needs and conditions in the various institutions. After the survey has been completed plans will be formulated for the adoption of a system which will afford occupation suited to the needs of the individual patient.

Bronx Pediatric Society.—At the meeting on November 2nd of the Medical Society of the County of the Bronx, the new organization was formed, which will hold its first scientific session on Wednesday, December 13th, the official name of which will be the "Bronx Pediatric Society." The object and purpose of the organization is the advancement of the knowledge of physiology, pathology and therapeutics of infancy and childhood. At this first meeting Dr. William Hinz and Dr. Joseph H. Gettinger will speak on "Pediatric Activities in Europe."

Association for Research in Nervous and Mental Diseases.—A meeting of the Association for Research in Nervous and Mental Diseases will be held on December 27 and 28, 1922, at the Commodore Hotel, New York City. The program for December 27, 1922, will be:

Presidential Address	Dr. Walter Timme
Epilepsy and the Convulsive State	Dr. Foster Kennedy
The Neural Mechanisms Underlying Convulsive States	Dr. J. Ramsay Hunt
Metabolic States Contributing to Uremia	Dr. Nellis B. Foster
Some Aspects of the Metabolic Disturbances Occurring during the Eclamptic State	Dr. Everitt D. Plass
A Preliminary Report on the Relation between Infantile Convulsions and Epilepsy	Dr. Douglas A. Thom
Ecology of Epilepsy	Dr. Charles L. Dana and Dr. Charles B. Davenport
Hematological Findings in Epilepsy	Dr. Nathan Rosenthal

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Psychobiologic Concept of Essential Epilepsy	Dr. L. Pierce Clark
The Acid Base Mechanism in Epilepsy as Influenced by Diet and Other Factors	Dr. Rawle H. Geyelin
Convulsions Experimentally Produced Compared with Convulsive States in Man; a Preliminary Report	Dr. Charles A. Elsberg and Dr. Byron P. Stookey
Experimental Convulsions. A Consideration of Epileptogenous Zones of the Central Nervous System	Dr. Lewis J. Pollack
Report of Plans and Progress in the Investigation of Convulsions, at Harvard Medical School	Dr. Stanley Cobb

LETTER FROM THE BALKANS.

(*From our own correspondent*)

Vienna, *November*, 1922.

IMMUNITY AGAINST RABIES.

In the Vienna Interhospital Medical Association a discussion was held as to how long immunity against rabies lasts after inoculation. The referent said that it often occurred that a person previously bitten and inoculated was subsequently bitten again by a mad dog. In such cases the question naturally arose as to whether such a person should be inoculated *de novo* against rabies, as was done in the first instance, or whether vaccination was superfluous by reason of the first inoculation having afforded immunity against further infection. The same question presents itself in the case of smallpox.

Before giving an answer to this very important question, the speaker said that it must first be decided how long the artificially produced immunity by inoculation lasted. The only information on this subject came from Paris and from the Budapest Pasteur Institute. Professor Högyes published an article in 1892 dealing with the question of duràtion of immunity, in which he described his observations bearing on eight immune dogs in which he repeated the tests, namely, injections with rabies virus after days, months, and several years. These experiments gave the average result that after an antirabic inoculation the immunity develcped in a very short time, in one case after seven days and lasted from four to seven years. A dog which was inoculated by Professor Högyes resisted the test infection for nine years, and being again test infected died of paralytic rabies. A hare inoculated on the same day with the virus taken from the brain of the dead dog died after three days' illness.

After a lively discussion the decision was that the average duration was between three and five years, say, about four years. Naturally individual factors play a certain rôle in this connection. Considering now how these facts hold good for human beings, up to the present time, there was an absence of no experimental data which could be relied on. In the absence of direct proofs when considering this question, one must reason by analogy and this must be based upon the dog experiments of Pasteur, Högyes, and Babes.

On account of the close relationship which exists between human and animal (particularly the dog) rabies, as well as the occurrence of the symptoms, we are justified in supposing that the process of immunity is analogous in men and dogs. Therefore it can be stated that in all probability the immunity against rabies in man also expires after a certain time. We are now in a position to answer this important question, whether to inoculate *de novo* the person subsequently bitten by a rabid animal. In the event of fresh bites by a mad dog revaccination is advisable in every instance, and is only superfluous when the fresh bite occurs at a very short interval after the previous antirabic inoculation.

SEXUAL IRRITABILITY.

In a recent lecture by Professor Nenam before the Medical Society, the speaker stated that the fact that the genital sense was subject to phases of irritative activity under certain circumstances was a point which was not without interest to medicolegal experts. It had been estimated that about one fourth of men are at one time or another afflicted with what is called sexual irritability. They may be divided roughly into three classes, one, men of the lithemic type, generally of fair complexion, large stature, and flabby muscles, in whom defective elimination causes irritation of the urinary tract. A second group comprises the neurasthenics who are prone to great variations of emotional excitement, the sexual emotion exhibiting the same lack of control as other emotions. Lastly, there are those whose genitourinary tract is the seat of chronic irritation of gonorrheal origin. Medicinal and hygienic treatment usually prove effective, provided the disturbance is referred to its special source, so that a correct appreciation of the probable etiology is of extreme importance.

LEAD POISONING IN AN ELECTRICAL STORAGE FACTORY.

In a suburb of Vienna there is a large electrical accumulator works, where four months ago a laborer died presenting symptoms of lead poisoning. This was followed by another death in consequence of chronic lead poisoning. The sanitary authorities have since made some pertinent inquiries. They found out that the conditions under which the laborers were working were grossly, if not criminally defective. They are obliged to make a thick paste of oxide of lead, which is used to coat the grids of storage batteries. The oxide of lead in powder form is shovelled out of a barrel, and about fifteen kilos are put into an earthenware basin. The latter is placed above a machine and tipped so that it falls about two feet upon revolving knives, by which it is mixed with sulphuric acid into a thick paste. Every time the basin is tipped clouds of lead oxide dust are created. The room where this mixing takes place is not properly cut off from the workshop where some forty pasters are at work. The sanitary authorities have ordered that wet methods should be substituted for the dry and proper ventilation and exhaust outlet gear be provided. At the same time, gloves and aprons should be systematically changed and ample washing accommodation be made available.

HYPNOTIC SUGGESTION AND IRRESPONSIBILITY.

For some time past it has been the fashion in Hungary for persons accused of murder and other serious crimes to plead hypnotic suggestion in order to be declared irresponsible. The plea has not been uniformly successful by the sensational use made of this hypothesis by advocates has caused a widespread feeling of uneasiness and apprehension among the public who, for the most part, are as credulous as they are ignorant of the nature and scope of hypnotism. In defence to this feeling the Hungarian Government has justly promulgated an ordinance forbidding the practice of hypnotism without special permission from the Board of Public Health. An Hungarian medical monthly, the *Gyakorlo Orvos*, published in Temesvár, commenting on the case, says that the prohibition will, in practice, apply only to hypnotism induced by other than qualified medical practitioners and especially to public exhibitions thereof. In regard to the latter, the propriety of the measure is hardly open to question, because public exhibitions of hypnotism, when they are not mere comedies, are very revolting. We are sceptical, the journal says, as to the power with which hypnotic suggestion is credited in the direction of inciting persons to crime, but, even if this is admitted, no ban is likely to eradicate it. Pocket picking and highway robbery are forbidden, yet they have their adepts. Hypnotism again is an intangible quantity, and for one person to accuse another of exerting hypnotic influence over him is only a euphonism for what in years gone by was called "the evil eye" or witchcraft.

HOUSE TO HOUSE VACCINATION IN ALBANIA.

In a report on vaccination in Albania, the Sanitary Commissioner of that country, M. Danilovac, stated that while in most districts the people as a whole have no objection to primary vaccination, there is a strong prejudice against the operation of revaccination, partly because it is considered unnecessary, and partly because in the case of boys it may interfere in a slight degree with their work. Another factor making against the operation is said to be the lack of interest displayed by municipal members and other civil subordinate officials. In some districts the decrease in vaccination and the increase in smallpox cases is directly ascribed to lack of energy upon the part of those who might be expected to set a good example. M. Danilovac in the course of his report throws out a suggestion that house to house vaccination might be introduced, as was done in India about ten years ago. It has proved a great success in England in popularizing vaccination and is very likely to prove equally successful in Albania. This would also be a good method for the distribution of quinine. This measure will meet with opposition from some of the vaccination staff, but the people will undoubtedly welcome a measure that will save them from the exertion and annoyance of taking their children to a distance.

ANTIVIVISECTION MOVEMENT IN ROUMANIA.

In Bucharest the opponents of physiological research are endeavoring to revive the old argument that vivisection is useless for the advancement of medical science, and may even be the cause of disastrous errors. A society has been formed for the propagation of these views, the members including several persons well known in society and in the fashionable world. It has not yet, however, made much progress, and at the first meeting held recently in the town hall the attendance was limited.

THE CONSIDERATE JUDGE.

In the Small Debt Court of Vienna a case of interest to the medical profession was decided by the Chief Sheriff a few days ago, where a medical man sued an employer for professional attendance on an employee. The sheriff considerately and sensibly said in giving his decision: "It is a positive hardship to a doctor to be summarily called away from his practice without some provision being made for his remuneration, more particularly if the case be of a very serious character, where the doctor, to be humane, cannot very well stipulate conditions regarding payment before giving his services, or, in the absence of any guarantee as to such, decline to give them. The hard letter of the law, however, allows the doctor no redress against the employer unless the latter has given his personal guarantee to be liable." The sheriff, in the absence of such a guarantee, was unable to give judgment in favor of the medical man, but suggested to the lawyer representing the defender that a fee should be paid the doctor on account of the urgent necessity for his services being tendered without delay. The suggestion, thus proffered, was agreed to.

THE PRESCRIBING OF HYDROTHERAPEUTIC MEASURES.

Dr. Dalmady, of Budapest, gives the profession a severe lecture on the probable mistakes that arise in the water treatment. The first important point in hydrotherapy is the proper selection of temperature, the intensity of the mechanical stimuli, with the duration and quantity to be administered. It is supposed that each case is clinically analyzed and the dietary properly arranged. In febrile diseases the temperature selected is often too low, while in the anemic, chlorotic and convalescent it is too high. In those prone to collapse cold compresses to the body with friction to hands and feet with warm applications are essential. In the anemic, high temperatures with mechanical nerve stimuli frequently applied at short periods, will produce the best results. In the case of those taking sitz baths the parts not exposed to the water should be well covered to prevent undue loss of heat. Where a combination of heat and cold is to be applied more care is necessary, and can only be carried out successfully on strong patients.

LONDON LETTER.

(From our own correspondent)

London, *October* 11, 1922.

REPORT ON THE VOLUNTARY HOSPITALS OF GREAT BRITAIN.

The third annual report on the voluntary hospitals of Great Britain, outside of London, for the year 1921, by Sir Napier Burnett, director of the hospital services of the joint council of the Order of St. John and the British Red Cross, has just been published. There is an introduction to the report by Sir Arthur Stanley, chairman of the Joint Council. Sir Napier Burnett states that, taking Great Britain as a whole, excluding the London area where the hospitals are under the supervision of King Edward's Hospital Fund, details of patients were received from 642 voluntary hospitals, eighty-eight per cent. of the total number of hospitals, with 39,973 available beds, ninety-five per cent. of the total possible, which show that 2,545,055 individual patients were treated during 1921, at a total cost to the hospitals of £5,275,176. Towards this expenditure the hospitals received £4,554,661, leaving a deficit on the year's working of £420,515. One third of the total ordinary income was derived from workmen's contributions and patients' payments. In 1920, forty-four per cent. of the hospitals were able to show a financial surplus on the year's work, whereas in 1921, despite the unprecedented extent of unemployment and general financial depression, the number of hospitals that were able to make ends meet increased to fifty-one per cent. Emphasis is placed on the fact that little information as to the actual work being done within the hospitals is given to the public in the annual reports of the hospitals. Sir Napier Burnett holds that, if the hospitals will realize their opportunities and instruct the public in the great work in which they are engaged, then the public will take a renewed interest in the "saving of their hospitals." Hospital provision for patients of moderate means is probably the most urgent problem calling for solution in the hospital world. Sir Napier Burnett is of the opinion that the full solution of this problem will not be reached until the medical profession come to realize that the payment of a hospital staff is merely centered in the question of the provision of hospital beds for this class of the community, and he appeals to the profession to take this matter into consideration and act in an advisory capacity to those hospital governors and trustees who are seeking to solve this question. Moreover, Sir Napier Burnett thinks that a new classification of hospitals is needed. Hospitals should be graded according to the quality of the work they do and the facilities they provide for carrying out such work. The group of hospitals known as teaching hospitals, in that they are associated with medical schools, should be graded as a group apart from all other hospitals, which, he suggests, could be graded into classes according to their general standard of equipment, laboratory facilities, etc. On such a basis the subscribing public would acquire the knowledge to enable them to appreciate why one class of hospital was necessarily more expensive than another.

LORD BURNHAM'S TRIBUTE TO LONDON HOSPITALS.

Lord Burnham, who is the proprietor of the *Daily Telegraph,* and who since the death of Lord Northcliffe is easily the most able and powerful of British newspaper proprietors, has always taken great interest in the hospital question. On October 7th last, as chairman of the educational auxiliary committee, in connection with the hospitals of London combined appeal, presided at a meeting of the heads of private and independent schools in London and the surrounding districts. Lord Burnham pointed that there were today in London just twice the number of sick poor who ought to go into hospitals for expert treatment than the beds could accommodate. If they summed this up, not only in terms of suffering but of human waste, they could realize what this endeavor meant for the well being of the community and for the recovery of the strength of England. Not only was this so but the very fact that the profession fell so far short of the necessities of the case was, to a large extent, rendering useless all the other machinery for medical aid under the National Insurance Act and as part of the great system of voluntary charity on which the British people had so much reason to pride themselves. The point of view, however, which he would place before those present as being interested beyond all others in the education of those coming to manhood was that it is by the great hospitals of London that the medical schools are kept up.

HEALTH WEEK.

This present week is Health Week, the purpose of which is to concentrate and focus the attention of the general public just for one week in the year on health questions. Lectures, addresses, demonstrations and sermons are being given in various towns throughout Great Britain on health subjects; and in London the children in all the schools are being asked to write an essay on self help in health. The best of these essays will be selected by the head teachers and sent to the committee for competition; £25 is offered in prizes. Medical officers are helping by the circulation of literature to show the methods to be employed in preventing and combatting disease. The Holborn Borough Council, Holborn, in a district of London, have obtained permission for health lecturers to visit factories and workshops.

STATE CARE FOR HEALTH OF SCHOOL CHILD.

The annual report of Sir George Newman, chief medical officer of the English Board of Education, had just been issued and is in every respect a most readable document, from both the medical and literary viewpoints. The writer is a master of literary style, and the report reads more like a romance than a dry-as-dust official production. It is shown that school medical inspection, established in 1907, has now developed, so far as the elementary schools are concerned, into a single comprehensive service. Every child is now inspected three times during the nine years of school life, on admission, at eight years of age, and before leaving school, as well as at other times when necessary. This involves the annual medical examination of two and a half million children.

In this service approximately two thousand medical men and three thousand school nurses are engaged. Other auxiliary services have developed, too, besides medical inspection and treatment, but these are rather on the preventive side. A new system of physical training is doing much to remedy physical impairment. Food, when recommended by the school doctor, is provided under the provisions of the meals act of 1906, for the malnourished, necessitous child. Cleansing schemes and school baths are preventing much gross uncleanliness, open air schools are providing sunlight and fresh air to children who suffer from anemia, incipient tuberculosis, rickets and other disabilities. Special schools are giving opportunities to the defective, the blind, the deaf, the feebleminded and the cripples. Nursery schools are aiding the little children who are found to be suffering from physical defects. Special classes are arranged for the ten per cent. of children who are proved to be seriously dull and backward. Sanatorium schools provide for the child suffering from tuberculosis.

The cost of this service recently has materially risen and now amounts to the prodigious sum of £2,982,898 a year of which over £1,000,000 is for medical inspection and more than a million for special schools. It may be said that the Geddes Committee, after investigation, considered this expenditure to be an economical investment in life, in health, and in capacity for work, and that curtailment would be to the disadvantage of the community. An encouraging part of the report concerns the relation of the school medical service to the national scheme of Health Reform. In the words of the report, "The child has become the starting point of the new preventive medicine."

SANITATION IN EGYPT.*

By J. Morton Howell, M. D.,
Cairo, Egypt,
Diplomatic Agent of the United States of America.

I desire but briefly to dwell on a subject which, it seems to me, is of prime importance to this country—to wit: Illiteracy and its twin companion insanitation, with all their terrible sequels. I wish first to call your attention to some few accomplishments of the medical profession within the past few years to demonstrate what may be done by a consecrated, intelligent effort to benefit the masses. Typhoid fever that was, until recently, the scourge of the people, in both civil and military life, is now almost wholly under our control, by adherence to wellknown laws of sanitation and vaccination. Diphtheria, the bane of existence in child life, since the discovery of the Klebs-Loeffler bacillus and the use of antitoxin, has been robbed of its terror. As to yellow and malaria fevers we stand in awe, and when we think of the countless millions who have filled untimely graves as the result of these two diseases, now absolutely under the control by reason of scientific investigation.

When I was in Panama a few winters ago and recalled the fact, that but a few years ago this canal zone, controlled by the United States, was perhaps of all places in the world the most pestilential, by reason of the prevalence there of these two diseases, and that since the discovery of the fact that two distinct well defined classes of mosquitoes were the etiological factors in the development of these maladies, and by reason of their discovery, elimination was made everywhere possible, I was prompted to uncover my head, thank God for such men as Walter Reed and Argomonti, who, placing their bodies on the altar of sacrifice, made this thing possible. It would but be criminal negligence for us not to use every human endeavor to hold these diseases under control. Of course, I could go on *ad infinitum* along the lines of the accomplishments of this noble profession, but I pause to say that there remains much yet to be done. Illiteracy and insanitation, you will permit me to say, are operating in tragic form and gigantic proportions, not only in your back yard, but on your front doorsteps.

In this country, where architecture was developed to a point of sublimity and grandeur, never attained by any other nation or people, and where was stored for research the finest library then known, all ten thousand years before many of the countries from which we owe our allegiance were even known to exist, makes or renders this indictment to which I have referred all the more aweful and tragic.

I respectfully submit to you that for Egypt to have a continuous and continued government, in which all the people are made the recipients of those God given rights and privileges to which they are justly entitled, there must be put into active motion those now well known rules of practical and scientific laws of health or hygiene, which will forever eliminate this blighting curse, and reverse the ratio of illiteracy which today stands as ninety-five to five. People in affluent circumstances must be made to feel and see that they are their "brother's keeper" and that it is "more blessed to give than to receive." They must recognize the importance, as well as shown the advantages of taking these benighted people from pens, scarcely good enough for the housing of sheep or cattle, surrounded by flies, mosquitoes, and filth; partaking of food and water of highly dangerous character, and placing them in an environment and in an enlightened condition of mind and body. Child labor should be removed from the workshops and streets and given a chance to cultivate both the mind and the body to a degree of self-preservation, to be made an asset instead of a liability to the government.

In Egypt in 1918 occurred 35,246 cases of typhus fever, with a resulting mortality, from this one disease alone, of 7,354 cases, nearly thirty per cent. You had in the same year of typhoid 3,118 cases with a resulting death roll of 935 cases or thirty per cent. The year 1921 showed a little better or lower mortality as to typhus, and likewise of typhoid, but the cases both numerical and from a mortality point of view were frightfully high. This in spite of an intelligent, alert, wellorganized department of health, with men at the various heads, I should say, from what I have observed, of a very superior type. The total number of deaths in Cairo in 1919, not counting the deaths of nonresidents who died here, was 31,547, which gives an annual death rate of 41.4 per thousand. The infant mortality in Cairo alone in 1919 was 7,641. The mortality rate was 238 per thousand births. Nor is this all, appalling as these figures show the conditions to be, thousands are left, from the sequelæ attendant upon these various diseases, in a condition worse than death. It is stated upon the best authority that ninety per cent. of the people of Egypt are afflicted with trachoma, and this high percentage obtains among all children of school age. Of ten thousand cases seen at the ophthalmic hospital in 1909, six per cent. were found to be blind in both eyes and 15.84 per cent. were blind in one or both eyes. This is an awful indictment and calls for the most skilled brains as well as the stoutest hearts to solve. It has been shown that this disease of the eyes is fifty-five times greater than found throughout the United States of America.

The etiology or causative factors and the character of the disease is known, and its cure and control is comparatively easy. What is the matter in Egypt that no better results can be obtained with all this scientific attainment as to both its cure and eradication? Ask your medical department at the board of health and they can, and will, answer, "Ignorance on the part of the great majority of this people, as to even the primitive laws, as to the matters of health and its control." What is the treatment? How may the problem be solved? My answer is: "Education." Education you say of the masses? Yes, and for those of the lowest state of the masses.

Of course, by education I do not mean to imply that the *fellaheen* or their children need to be of necessity placed or prepared for the university; but I do mean to imply that they should be taught to read and write, and taught by means of the slide (or cinema) and otherwise, the laws or principles of sanitation and the things essential for the preservation of life and health.

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*Address delivered at the Alumni Association of Bayrout University.

Book Reviews

FRACTURES.

The Treatment of Fractures. By Charles Locke Scudder, M.D. Ninth Edition, Revised with 1252 Illustrations. Philadelphia and London: W. B. Saunders Company, 1922. Pp. 749.

The experiences of the late war are reflected in this, the ninth, edition of a splendid manual on fractures. The different methods of treatment, such as those of applying traction and suspension and the suitable appliances necessary, which were found valuable in military surgery, have been applied to civil injuries. The author aims to secure the preservation of joint function and much attention is also paid to the restoration and preservation of the woft parts in the neighborhood of the fractured bones.

The newer features emphasized are: the Carrel-Dakin treatment of infected wounds, the importance of the proper first-aid and early treatment, including the apparatus required, the use of the Thomas and other similar splints, the principle of indirect and direct traction for the correction of the shortening of long bones and in gunshot fractures, the necessity for röntgenograms of every fracture, the true indications for the use of metallic substances around the bone, the suspension treatment, the early active motion of joints near fractures and of septic joints, and the Whitman treatment for fractures of the neck of the femur; also the necessity of organizing special fracture services in hospitals and the systematic teaching of the subject of fractures to undergraduates and graduates. Although much of the older material has been retained, considerable new material is also embodied in this edition. The chapter on the operative treatment of fractures is particularly instructive and the subject of leverage of the bones is very clearly discussed with illustrations. There are also special chapters on the pathology of fractures, anatomic facts regarding the epiphyses, gunshot fractures, the relation of x rays to fractures, the use of plaster of Paris and dextrin bandages and notes on a few dislocations, respectively.

The bibliography is arranged according to subjects and the location of the fracture; with few exceptions, it does not include the very latest contributions on the particular subjects. About 200 illustrations have been added and the legends are all to the point and complete, making this book a most desirable textbook and atlas for both the student and graduate. It still holds its place as one of the best books on the subject.

ANESTHESIA.

Choloroform Anesthesia. By A. Goodman Levy, M.D., M.R.C.P. With a Foreword by Arthur R. Cushny, M.D., LL.D., F.R.S. New York: William Wood & Co., 1922. Pp. vii-159.

This book treats the subject of practical chloroform anesthesia from the viewpoint of the basal sciences and the laboratory. After discussing the physical properties and the pharmacology and toxicology of chloroform, the author takes up such aspects of the question as the deprivation of oxygen and its relationship to asphyxia, the mechanism of the absorption and the elimination of chloroform, as well its clinical considerations. The last chapter deals with the subject of delayed chloroform poisoning. The bibliography is extensive but not up to date, nor does it give sufficient credit to American authors. The subject matter is dealt with in a most thorough and scientific manner, and it contains much material of an intensely practical value. Although the use of chloroform is generally frowned upon in America, this little monograph is an excellent guide for those who for some reason or other insist on using it.

PHARMACOLOGY.

A Manual of Pharmacology and Its Applications to Therapeutics and Toxicology. Second Edition. By Torald Sollmann. W. B. Saunders Company, 1922.

In reviewing a book such as Sollmann's, the reviewer must keep himself well in hand or his enthusiasm will carry him far beyond his proper sphere. Instead of offering helpful criticism to his reader, he will tend to offend by the vaporings of an apparently inane mind. Sollmann has included between the covers of his volume an enormous amount of information, essential alike to the practising physician and to the laboratory worker. The manual is really an encyclopedia for it discusses the bearings of all the allied sciences on therapeutics and pharmacology. The final object of the study of the action of drugs is the better use of these drugs in the treatment of disease; the therapeutics of a drug should be a natural corollary of its pharmacology. Sollmann brings this relation about very effectively by placing immediately after the description of each action of the drug, the application of that action to the treatment of disease. The practising physician will find this juxtaposition of pharmacology and therapeutics one of the most helpful features of the volume. Pharmacology, as a science, comprises some broad conceptions and generalizations and some detailed conclusions which are of the utmost importance to every student and practitioner of medicine; it also comprises a mass of details too burdensome to be remembered but too important to be wholly neglected. Sollmann presents both types of information and by using large print for essentials and small print for details, accomplishes two results: he avoids confusion and he makes it possible to obtain without unnecessary effort either the essentials or the details of the action of each drug. Bibliographic references abound and the 78 pages of references at the end of the volume will readily fulfill their purpose of putting the student on the track of further details. Many changes in the text have been necessitated by the rapid and extensive development of pharmacology since 1917, when the first edition appeared; there are useful discussions of such new subjects as the war gases, the new anesthetics, cuprein, etc. The review cannot be considered complete without a commendation of the publishers. Here is a volume of 1066 printed pages that weighs only three and three quarters pounds and measures exactly one and five eighths inches in thickness. Would that other publishers would use thin paper that is perfectly opaque! If the author set for his goal the presentation of all that is known about and relating to pharmacology he is to be congratulated, for he has realized that ambition.

STUDY OF MAN.

Allgemeine Prognostik, oder die Lehre von der ärztlichen Beurteilung des gesunden und kranken Menschen. Von Prof. Dr. Theodor Brugsch, Berlin. Mit 29 Textabbildungen. Zweite, wesentlich erweiterte Auflage. Berlin, Wien: Urban & Schwarzenberg, 1922. Pp. vii-623.

In this treatise, the author places at the disposal of the medical profession a collection of facts, heretofore well known but never utilized for the purpose of determining a prognosis and he also opens up for future study and investigation a vast but neglected field of investigation. Diagnosis and therapy have occupied the bulk of the physician's attention and but very little attention has been paid to statistics and the lessons to be drawn therefrom, as the statistics are usually the concern only of national, state, local and private health agencies for the purpose of estimating the morbidity and mortality in a collective sense, but they have not been applied to the subject of prognosis of a particular patient. The facts that a certain proportion of patients afflicted with a certain disease recover, another proportion suffer with complications and another proportion end fatally, have little significance for the patient; the important facts to know are whether a particular patient with a certain constitutional complex will recover, what his particular chances of recovery are and what are the chances of being afflicted with complications. This phase of the subject has not been studied methodically and it is the purpose of the author to lay the foundations for such investigations.

Prognosis deals with the prediction of the outcome of disease, which depends upon the severity of the disturbance, on the one hand, and the resistance of the organism, on the other. The disturbance in the organism consists of the immediate effect of the cause, its severity and duration and of the affectability of the tissue, all of which are inconstant factors. The decisive factor is the physiologic rôle of the function injured in its integrity. An insignificant primary affection may lead to a serious disease when the former has the power of progressing, especially when it can intrench itself in the body, regardless of an individual predisposition or of an individual resistance. There are very few noxa that are absolutely fatal for everybody, just as there are not too many that are absolutely trivial for everybody: the individuality of the organism is responsible in the large majority of cases for the outcome and this in turn depends upon such factors as the duration of the disease, the presence of fever, the involvement of the parenchyma, the limitation of the disease, the extent of the resorption of exudates and also the age of the patient, the vigor of his constitution and other single factors which are recognizable only by their effects, such as the strength of the heart action, the respiratory musculature and the tenacity of nerve action. All of these factors enter into the make-up of the constitution of a patient, a term that is still applied too loosely. Prognosis, like treatment, should take into consideration the patient and not the disease.

In addition to the disease, the patient himself should be studied, not as a substitute but as a supplement to the disease. The author considers the term "person" preferable to the term "constitution." He considers the subject of prognosis from the static, kinematic, functional, genetic and personal standpoints. These aspects of the question are the psycho-physical elements, which have never before been considered in any clinical treatise concerned with constitutional factors. The static element has reference to the relationships of habitus and structure; the kinematic estimate to the developmental factors, the functional estimate to the activities of the different organs and systems, the adaptability of the organism to its environment and to the various local and constitutional diseases; the genetic estimate deals with the hereditary traits and the heredity of disease, and the personal estimate deals with the relationship of mind to body. All of these factors must be considered as they throw a new light on the subject of prognosis.

INDICAN.

Die Indicanämie. Von Dr. Gustav Baar, Portland, Oregon, U. S. A. Berlin and Vienna: Urban and Schwarzenberg, 1922. Pp. vi-148.

With the introduction of the more delicate Jolles test for indican, the author endeavored to revise his former statements on "indicanuria," which were based on the qualitative Obermayer test, with the result that he was able to replace the former indefinite terms, such as "traces," "moderate," "considerable," "abundant" and "very abundant" by accurate numerical values. He also found: 1, that almost every urine has an average indican content of 6.5 mg. per liter; 2, that constipation does not produce indicanuria; 3, that achlorhydria (frequently associated with pernicious anemia) is often associated with hyperindicanuria; 4, that pernicious anemia produces a considerable indicanuria; 5, that a definite relationship between the amount of indican retained in the blood and that excreted in the urine cannot be expressed by a constant, although cases of chronic nephritis show a greater amount of indicanuria than other cases; 6, that he could not prove that every gastrointestinal lesion, of whatever character, results in indicanuria, as such a proof requires extended observation; 7, that chronic cardiac insufficiency with anasarca and ascites is always associated with indicanuria, which disappears with the restoration of sufficiency; 8, that venous blood contains more indican than arterial blood, a fact that undoubtedly speaks in favor of a tissue indicanemia and tissue indicanuria (metabolic indicanuria).

The author claims that 0.16 mg. per cent. indican in the blood indicates renal insufficiency and also that gastrointestinal diseases and decompensated hearts produce the same blood indican value. He finds that in pure cardiac congestion, the indican test will make a differential diagnosis between a congested kidney and congestive nephritis. The method of determining the residual nitrogen in renal insufficiency is very much inferior to that of the determination of the indican content in the blood and the latter has the additional advantage of simplicity. The persistence of the excessive blood indican values is typical for irreparable renal insufficiency, whereas the residual nitrogen method, even with irreparable renal insufficiency, sometimes shows normal and sometimes more than normal values. The separate examinations of the arterial and venous blood seem to indicate the existence of a "metabolic" indicanemia in addition to the formerly recognized "intestinal" and "septic" forms. Pernicious anemias and cachexias with an increased destruction of tissue albumin also produce indicanemia.

After discussing the qualitative and quantitative determinations of indican, these are compared with the various methods of testing renal function. The second part of the monograph is concerned with the determinations of both the blood and urine indican contents as well as the blood and urine nitrogen content in gastrointestinal diseases, severe anemias, emphysema, acute and chronic nephritides, uremia, nephroses, unilateral renal diseases, arteriosclerosis, nephrosclerosis, insufficiency of the heart and congested kidney.

OTOLARYNGOLOGY.

Otorhinolaryngology for the Student and Practitioner. The Second English Edition with 589 Illustrations. By Dr. GEORGES LAURENS. Authorized English Translation of the Fourth Revised French Edition by H. CLAYTON FOX, F.R.C.S. (Irel.) With a Foreword Contributed by SIR J. DUNDAS-GRANT, M.A., M.D., F.R.C.S. New York: William Wood and Co., 1922. Pp. xii-350.

Laurens lays stress, throughout, on careful physical examination and on functional tests. The illustration and descriptive text are unusually complete, instructive, and practical. The first edition was exhausted in eighteen months. The author, encouraged by the appreciations and suggestions he received, has revised the whole work and added a number of chapters without altering the scope or the practical character of the work.

NERVY.

Nerves and Personal Power. By D. MACDOUGALL KING, M.B. New York and Chicago: Fleming H. Revell Company, 1922. Pp. 312.

This well intentioned book, written under rather tragic circumstances, is presented from a personal human angle rather than from any scientific approach. It is unfortunate that a man with Dr. King's exceedingly fine spirit should not have been versed in the more fundamental precepts of psychopathology before attempting a book of this kind. The book will remain as a monument to a heroic effort of a brave soul, but its value to medical science is nil.

MEDICINE SERIES.

The Practical Medicine Series. Comprising eight volumes on the year's progress in Medicine and Surgery. Under General Editorial Charge of CHARLES L. MIX, A.M., M.D. Vol. I. General Medicine. Edited by GEORGE H. WEAVER, M.D.; LAWRASON BROWN, M.D.; ROBERT B. PREBLE, A.M., M.D.; BERTRAM W. SIPPY, M.D.; RALPH C. BROWN, B.S., M.D. Series 1922. Chicago: The Year Book Publishers, 1922. Pp. 715.

Volume I of this most convenient series dealing with general medicine has been edited, and well edited, by Weaver, Lawrason, Brown, Preble, Sippy and Ralph C. Brown. The difficulties in getting out a small book covering a number of vastly important topics in an adequate way is great. But these men have done a creditable task in their work on this most valuable handbook.

PHYSIOLOGY.

Kirke's Handbook of Physiology. Revised and Rewritten by CHARLES WILSON GREENE, A.M., Ph.D. With 524 Illustrations. New York: William Wood & Company, 1922. Pp. ix-820.

The book is now in its tenth edition. Little need be said of this standard and thoroughly revised textbook. In it the latest researches on the respiratory, cardiavascular and various other systems, have been included. The material presented is readable, and, more important, reliable.

AMERICAN LITERATURE.

The Bright Shawl. By JOSEPH HERGESHEIMER. New York: Alfred Knopf, 1922. Pp. 220.

"Perhaps what they had found was, after all, within them, that for which they had swept the sky." Thus ends *The Bright Shawl,* stimulating to the last our curiosity as to whether Mr. Hergesheimer knew what he was about in giving us the portraits of Charles Abbott and Andres. Cuba, her battle for freedom, a young American and the Cuban youth who fulfills the American's ideal as intellectual mentor and counterpart. Together they embark upon the psychological defense of the helpless, abused, small country. Intrigue, mystery, color, aloofness from passion for Charles Abbott (need we cite from the *Bab Ballads* that "turtle and his mother were the only things he loved"); frustration, infatuation, death for the beautiful Cuban boy who by his mad passion very nearly wrecks Charles' belief in their sacred cause. And throughout the years following the vivid moments lived in memory in the story, Charles continues highminded, ineffectual, we presume still eager to help lost causes and never quite doing anything, all because of the discovery that his god's feet were clay. He reasons with himself at this late date. Could he not have kept the ideal inviolate by the sacrifice of the lad he loved? He prefers and has always preferred to live in achievements recalled to the sound of the piano next door.

An exotic, colorful book. As ever, Mr. Hergesheimer has challenged the commonplace. The thing drips romance, the romance tense with moviesque danger, the hidden glint of steel, the tropical fever of independence. And again we wonder, how much does Mr. Hergesheimer know about the psychopathological inevitableness of his homosexual characters?

LIFE.

City Block. WALDO FRANK. Waldo Frank, Darien Conn., 1922. Pp. 320.

Apparently our silly censorship drove Waldo Frank into publishing this masterful bundle of sketches privately. Like a clever surgeon, Frank dissects out the sore spots of one of our social city blocks. With unerring precision he cuts mercilessly into the diseased tissue, examining the essential parts with a critical eye, and asks the reader to look with him under the microscope. Many will say he exaggerates. So does life. We have had too much banality; too much mush and soft pedal endings. Here we have truth portrayed by one of the more courageous of the younger writers. Physicians who also deal with disease and life in order to make life the more livable will appreciate Frank, perhaps more than others. He has much to say and has a manner of telling all his own. Some will insist that Joyce may have influenced this writing. No matter, it is forceful, somewhat impressionistic, but gives one over to thinking about it all and leaves one in admiration for the art which is shown.

PSYCHOPATHOLOGY OF THE FAMILY.

The Judge. By REBECCA WEST. New York: George H. Doran Co., 1922. Pp. 491.

A romantic tale in a modern setting. Edinburgh is shrewdly pictured, the byplay of a city's foibles spreads a colorful background for the love story of little Ellen Melville. At seventeen she is groping between phantasy and reality. Her lover comes to her at the moment when her dream life is rudely threatened. Her blossoming to adulthood follows an intricate and marvelous pattern. The tragedy of Marian Yaverland, Richard's mother, weaves a relentless design in which Ellen moves, a vivid skein that in the end resolves into one more tangle of the life mesh of the entire family. To reveal more of the plot would spoil for the reader the haunting suspense with which Miss West so masterfully grips the substance of her story.

In passing, however, certain details merit comment. The preoccupation in the book with the unmarried mother, the psychic reaction of environment upon the wanted and the unwanted child, the merging and separating of love object and mother image, all furnish food for appreciative thought. The book is lengthy. Its theme loses a little of its drama in the sheer force of vivid words with which it is clothed. Naked, the sweep of the story might be unbearable in its intensity. Muffled as it is in beautiful descriptions, clever notings, and keen vision, it is still great enough to make one catch one's breath —and wonder.

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Medicoliterary Notes.

Through the activities of the New York State Commission for the Blind, steps are being taken to establish blind men and women in independent trades. One of the most suitable and lucrative of these trades is that of the news dealer. New York has one hundred and fifty blind men and women carrying on this work. In the smaller cities and towns, where there is room on the street corners small kiosks that can be comfortably heated have been erected, and here the blind news dealer can profitably sell his wares.

* * *

Luigi Pirandello, author of the current play, *Six Characters in Search of an Author,* is a professor in an Italian university. He did not write his first play until he was over fifty. Since then—five years ago—he has written more than twenty plays of many types. A published volume of his dramatic works, containing the above mentioned play, *Henry IV,* and *Right You Are—If You Think So!* is announced for the near future.

* * *

A recent issue of the New York *Times* quotes statistics as to the increase of doctors in Germany. At the beginning of this year there was one physician to every 1,700 population, as against one to every 1,900 in 1913. In spite of the great territorial losses of Germany, on January 1, 1922, the country had 36,186 doctors, as against 34,136 in 1913. The number of women medical students has doubled since 1913.

* * *

Georges Clemenceau's first visit to America was made a few years after the close of our Civil War. He came as a medical student and presented to the Astor Library a copy of his thesis, *De la Génération des Elements Anatomiques.*

* * *

Maude Royden, author of a very sane and practical book on sex for popular reading entitled *Sex and Common Sense,* is assistant minister at the City Temple in London and has been a lecturer for the Oxford University extension courses.

* * *

The recently opened Museum of the American Indian at 155th Street and Broadway has on display about 2,000,000 specimens of American Indian life and handicrafts. All tribes are represented. The collection is to be known as the Heye Foundation after the founder and director of the Museum, George G. Heye. This is the only institution in the world devoted exclusively to the preservation of the relics and other records of the prehistoric races of the Western Continent.

* * *

Turkey has recently enacted her first legislation for the betterment of conditions of the working people. The fifteen thousand coal miners in one of the mining districts will profit by these laws, which provide that mine owners must construct for their workmen houses of concrete, stone or brick, with wooden floors and an adequate number of windows. A public bath, a mosque, and evening schools must be established in each mining district, and a pension fund created for injured and aged employees.

* * *

Discovery has recently been made in Paris of the manuscript of an unpublished short story of Balzac, entitled *Les Fantaisies de la Gine.* The story is believed to be drawn from actual happenings in the lives of prominent men and women known to Balzac on his visits to Milan, hence never printed during his lifetime for fear of disagreeable consequences to them and himself.

* * *

H. Addington Bruce has an article in the *Century* for December on Testing the Mental Tests. Dr. Bruce is frankly skeptical of the results of some of the forms of mental testing. He believes also that degeneration of the human race began when machinery forced the specialization of labor and drove the underpaid laboring man into a life of routine and drudgery in the slums.

* * *

A new Chinese game is being introduced into this country. Its name is Mah-Jong, the Game of One Hundred Intelligences. It is said to be "a little like rummy, a little like poker, dominoes, and a trifle like bridge." The publishers, G. P. Putnam's Sons, are soon to issue a book about it.

Practical Therapeutics

NONSURGICAL QUADRANT TREATMENT OF INTERNAL HEMORRHOIDS AND PROLAPSE OF THE RECTUM.

By Charles D. Aaron, Sc D., M. D.,
Detroit, Mich.,
Professor of Gastroenterology in the Detroit College of Medicine and Surgery.

In 1916 Terrell reported his successful treatment of internal hemorrhoids by the use of quinine and urea (1). He found that when quinine and urea hydrochloride solution was introduced into the subcutaneous tissues a fibrinous exudate was thrown off from the adjacent blood vessels, causing a retardation of the blood current at that point. The coagulum occurs about the blood vessels, not in them; their obstruction results from pressure from without. The exudation is not sufficient to interfere with the circulation, nor does it induce sloughing of the part involved. After cautious experimentation it was found that a solution of quinine and urea hydrochloride gave splendid results in certain selected cases of hemorrhoids, and later Terrell (2) reported 313 cases treated by the injection of five and ten percent solutions, the treatment being uniformly successful in chronic internal hemorrhoids with protrusion and bleeding as their chief symptoms. He does not consider that the injection method is suited for inflamed, strangulated or external hemorrhoids.

In this paper I wish to make it clear that the whole work, preparation of patient, method of preparing solution, manner of making the injections, and the whole procedure described herein, is that perfected by Terrell. The only point I wish to emphasize is that after working with the injecting fluid a short time I discovered that it was not necessary to pick out each pile and inject it separately. Better results and quicker recoveries were attained by what I call the nonsurgical quadrant treatment. It is successful in all cases of internal hemorrhoids, even when there is prolapse, protrusion, hemorrhage, or ulceration. The important feature is that only one quarter of the rectal area is to be treated at one sitting. But it should be emphasized that the whole of this quarter must be thoroughly infiltrated with the injecting solution. This procedure is to be repeated once a week, so that at the end of four weeks every quadrant having been treated, the patient is on the road toward a rapid and complete recovery.

With due observance of the requirements of asepsis the work is absolutely safe and can be done without risk or danger. I always use a five per cent. sterile solution of quinine and urea hydrochloride and have never found it necessary to use a stronger solution. Stronger solutions may possibly cause sloughing, which never occurs with a five percent solution, providing the injection is made sufficiently deep and not to interfere with the superficial circulation.

It is not necessary to bring the hemorrhoids into view, but it is important to saturate the quadrant with the quinine and urea solution. The ordinary hypodermic needle attached to a five c. c. glass syringe is introduced through the mucous membrane into the tissue at the centre of the quadrant, and the solution is so injected as to saturate this entire segment of the rectum. To accomplish this requires from one to five c. c., depending upon the size of the enlarged veins in the quadrant. After the needle is inserted well into the body of the quadrant, it should be held in the same position for a moment after the injection to prevent bleeding at the point of puncture. The following day a digital examination shows the quadrant as a large thickened indurated mass. This induration gradually diminishes in size and at the end of a week is nearly all absorbed. Quinine and urea hyrochloride is a decided hemostatic, and a bleeding hemorrhoid will rarely continue to bleed after the first treatment, providing the quadrant injected contains the bleeding veins. The hemorrhoids become atrophied as a result of the restriction of their blood supply.

TECHNIC.

The patient is to have a simple enema two hours before coming to the office. The available light in the office will determine the posture of the patient on the table; the area of treatment will be accessible whether he lies on the right side or on the left. The anal region is to be thoroughly cleansed with soap and water, followed by the application of alcohol, without shaving. We divide the anal region into four equal parts by an imaginary line along the raphe anococcygea and a transverse line through the ischia at right angles to this line. We thus have four quadrants (Fig. 1). By asking the patient to bear down we easily bring into view the hemorrhoids that protrude or bleed, and this quadrant is the first to be treated (Fig. 2), though the ultimate result will be the same whatever quadrant is first injected. Hirschman's or Martin's oblique anoscope (Fig. 3) is carefully introduced so that the oblique end faces the quadrant that is to be treated, and it is pushed forward until it touches the rectal wall (Fig. 4). The anoscope should be introduced quite high, until the end is half an inch above the internal sphincter. It is important that the injection be made a little above the internal sphincter, because all the main bloodvessels of the hemorrhoid usually enter from the upper part. Avoid the anal canal, between the sphincters. By making the injection high, the solution is carried directly to the hemorrhoid.

The exposed quadrant is now thoroughly swabbed with alcohol, and at the point of puncture a drop of tincture of iodine should be applied. The needle of a long glass barreled syringe that has been thoroughly sterilized and filled with five c. c. of a five per cent. quinine and urea solution is introduced in the centre of the quadrant through the mucous and submucous membrane directly into the tissue (Fig. 4). The fluid should be injected slowly, under light pressure, until the quadrant enlarges and distends to the size of a small English walnut. The injection should be made in a line with the walls of the anal canal. The needle is held in position for a moment to prevent oozing at the point of puncture, and is then withdrawn and the anoscope is removed.

Upon removal of the anoscope the enlarged injected quadrant occasionally prolapses. With the oiled rubber gloved finger the part is gently replaced while the patient is asked to bear down. There is never any pain or discomfort.

After remaining quiet for a few minutes, the patient is allowed to depart, and is instructed to return in a week to have the opposite quadrant injected; and this is again repeated weekly until all four quadrants have been treated. It is unwise to treat more than one quarter of the rectum at a single sitting, because the organ must continue its function, which might be retarded on account of the induration following treatment.

ADVANTAGES.

The great advantage of the quadrant treatment is its simplicity. It is unnecessary to dilate the external sphincter, as is done when the patient is subjected to surgical treatment. The mucous membrane is not torn nor subjected to extensive bruising. There is no destruction of mucous membrane. Patients are not compelled to go to bed. The anesthetic effect of the quinine and urea is prolonged, and relief from pain is almost instantaneous. Hemorrhage always ceases if the quadrant treated contains the bleeding vessels. If bleeding vessels are in more than one quadrant, all hemorrhage will not cease until the second quadrant has been injected. Usually after the first quadrant treatment, those suffering with protrusion are relieved of this symptom. The prolapse entirely disappears after the last quadrant treatment.

This method of treatment for internal hemorrhoids and prolapse is to be preferred to surgery because there is no destruction of tissue and no danger of stricture. The cases can all be treated in the office and the patient need not go to bed, so there is no loss of time. After an experience of four years of successful treatment, I must verify Terrell's conclusion that quinine and urea hydrochloride solution is a specific in that large class of chronic internal hemorrhoids the chief symptoms of which are protrusion and bleeding. The injection is eminently satisfactory and applicable practically to all cases. The solution is absolutely nontoxic.

The quinine and urea treatment of internal hemorrhoids has revolutionized the outlook in this affection. My safe and simplified nonsurgical quadrant method of treatment (four rectal segments, four injections, in four weeks) not only obliterates the hemorrhoids but keeps the patient free from pain by acting as a local anesthetic while recovery is taking place.

Hemorrhoids are, as we all know, simply enlarged or distended veins, and the same causes that brought about this condition in the first place may act to the same end after any treatment, surgical or nonsurgical. A reappearance several months or years after obliteration by the injection method is no evidence whatever of the failure of the method. Yet my observation is that recurrence after the quinine and urea treatment is extremely rare. In my four years' experience there have been no recurrences. Let surgery be reserved for the cases in which this much milder, more conservative and eminently successful method (by quinine and urea) cannot be applied.

The turgescent hemorrhoid involving the mucous and submucous tissue often so separates itself from the muscular layer that not only can the mass be easily moved, but it prolapses readily. The injection of a five per cent. quinine and urea solution produces such an amount of fibrinous exudate that, after the hemorrhoid is atrophied the submucous membrane is again attached to the muscle, and the tissue seems to become fixed. I have taken advantage of this point and have used the injection in cases of procidentia recti with most gratifying results. The quadrant treatment for prolapse of the rectum, followed out just as though the prolapse were due to hemorrhoids, brings about a recovery in nearly every case.

REFERENCES.

1. Terrell, E. H.: Treatment of the Uncomplicated Internal Hemorrhoids with Quinine and Urea, *Proctologist and Gastroenterologist*, September, 1916.

2. Idem: Quinine and Urea in the Treatment of Hemorrhoids, *Journal A. M. A.*, November 3, 1917.

812 Kresge Building.

Transfusion.—Levine and Segall (*Surgery, Gynecology, and Obstetrics*, September, 1922) conclude that: 1. The compatibility of the recipient's and donor's bloods must be determined prior to each and every transfusion. 2. No transfusion must be done during or within twenty-four hours after prolonged ether anesthesia even when the donor has been found suitable previous to the beginning of anesthesia. 3. Much depends upon the accuracy of the test. It is, therefore, preferable to do both the indirect test to determine the group of donor and recipient, and also the direct test, to corroborate the compatibility of the bloods, thus checking up one test by the other.

Treatment of Fracture Involving Lower End of Radius.—T. K. Richards (*Boston Medical and Surgical Journal*, July 20, 1922) says that to secure the maximum good results functionally in fractures involving the lower end of the radius treated by immobilization with anterior and posterior wooden splints the following points are important: 1. Break up the impaction. 2. Immobilize with splints that fit the bones and not the arm, i. e., narrow splints. 3. Remove the posterior splint on the third day. 4. Cut down the anterior splint on the tenth day.

Tendon Implantation.—W. E. Gallie (*American Journal of Surgery*, September, 1921) concludes that: 1. Wounds of tendons heal by ordinary scar tissue which is produced by the areolar membranes on the surfaces and the conncetive tissue trabeculae which separate the bundles of fibres. 2. This scar tissue, when subjected to strain, is liable to stretch or break unless it is present in considerable quantities. 3. To unite tendon to bone as in tendon fixations or transplantations, it is necessary to place it in close contact with the bone over a considerable distance in order that the scar tissue may be strong enough to withstand the anticipated strain. It is also necessary to remove all the areolar membranes from the surface and it is preferable to split the tendon in order that the raw surface may come in contact with bone. 4. To unite tendon to tendon it is necessary to place raw surfaces in contact over sufficient distance to ensure the required strength in the scar. This may be conveniently done by braiding or splicing one tendon into the other.

Diathermy in Surgical Practice.—W. H. Clayton-Greene (*Lancet,* June 17, 1922) claims that the action of diathermy is that a cautery with an enormously increased area of destruction. Its chief advantage is the great ease with which the current can be directed to growths in relatively inaccessible regions. The author applied this treatment extensively to the oral and vesical regions.

In advanced cases of carcinoma of the tongue, tonsil, and floor of the mouth, diathermy has the following advantages: 1, it avoids cancerous infection of the wound; 2, the area of destruction is much greater than is obtainable with the knife; and 3, its applicability to otherwise inoperable cases. In the latter group of cases it alleviates both physical and mental suffering and a number of cases are even cured by it. The disadvantages are: 1, the necessity of ligating the main vessels (lingual) crossing the route of the cautery to avoid secondary hemorrhage; 2, the production of a foul slough in a foul cavity; and 3, bone necrosis for a long time from contact with the cautery, but this may be an advantage as it destroys that portion of the bone in contact with the cancerous area. If the cervical glands are not involved, extensive gland dissection is unnecessary. With extensive dissections (removal of glands, ligature of vessels, and subsequent destruction of the cancerous area), recurrences appear more certainly if the operation is done in two stages.

The use of diathermy is more popular in the bladder region than in the mouth. With extensive vesical growths, where wide resection is necessary and possibly dangerous to life, diathermy is the procedure of choice. By widely opening the bladder and passing down a nonconducting speculum, the growth is adequately exposed and it can be easily, immediately and entirely destroyed with less risk of infection of the wound. The resulting scarring of the bladder does not seem to interfere with the function of the ureters.

Treatment of Chronic Empyema.—U. L. Keller (*Annals of Surgery,* November, 1922) concludes that: 1. The chronic type of empyema, especially those with large cavities, should occur but seldom if early aspiration followed by negative pressure treatment is promptly instituted. 2. Empyema cavities can be obliterated by discission and chemical decortication plus implantation of certain muscle bodies. 3. The patient's vital capacity and resistance to intercurrent disease can be increased by complete eradication of infection and the methods of decortication already mentioned. 4. Chemical decortication, if used injudiciously, may result in rupture of the visceral pleura, dangerous herniation of the lung, and hemorrhage, but the expanded lung retains its expansile power longer than when surgical decortication is practiced. (It should never be used in such a concentrated form except in the open type of operation.) 5. The pleurobronchial fistula is one of the commonest causes of persistent cavities. 6. Subperiosteal resection of ribs at the point of division should be discarded and rib section flush with periosteum adopted. 7. Obliteration by expansion of lung which means increased vital capacity should be practiced rather than cavity diminution by collapse of the chest wall. 8. Sterilization of the cavity can often be accomplished even in longstanding cases, but reinfection will invariably occur if the parietal pleura is not removed in a case of over one year's duration, especially if it is of the hemolytic streptococcus variety. 9. Daily cultures of the wound are necessary to check the progress and to determine the amount of Dakin's solution to be used. 10. The many step, open or fractional operation, has many advantages.

Fibromyxomata of Nerve Trunks.—E. A. Lumel (*British Journal of Surgery,* October, 1922) concludes: 1. That a hemorrhagic cyst of spontaneous origin arising in a peripheral nerve may be innocent. 2. That, in the absence of more definite evidence of sarcoma, such as infiltration of the nerve above and below the lesion or adherence to surrounding structures, it would have been advisable in this case merely to puncture the cyst and remove as much as possible of its wall without interfering with the continuity of the nerve bundles, thus avoiding the risk of incomplete regeneration after resection and end to end suture.

Nerve Resuture.—J. S. B. Stopford (*British Journal of Surgery,* October, 1922) states that: 1. Regeneration may occur, under favorable conditions, after the resuture of a peripheral nerve. 2. The end results after successful resuture are similar to those observed after a successful secondary suture. 3, The causes of failure seem to be the same as in secondary suture, with the addition of: a, Greater disturbance of the intraneural anatomy by the further resection; b, the effect of a third injury to the nerve fibres upon the cells in the anterior cornu and posterior ganglia. 4. Excluding complications, resuture is contraindicated: a, when more than three years have elapsed since the time of the reception of the injury to the nerve; b, when extensive intraneural fibrosis has been encountered at the first operation. 5. The imperfect recovery of function and sensation, which is almost invariably found, even under the most favorable circumstances, after secondary suture or resuture, is chiefly due to: a, disturbance of the internal anatomy of the nerve trunk; b, intraneural fibrosis.

Treatment of Surgical Shock.—A. R. Munroe (*Canadian Medical Association Journal,* March, 1922) says that from a practical point of view the treatment of surgical shock may be divided into prophylactic and active. Prophylaxis includes the elimination of factors conducive to shock, such as fatigue, worry, fear, excessive, deep, or prolonged anesthesia, and the draining the tissues of fluids by purging before operation. The anesthetized patient should be handled as gently as possible, and due regard paid to warmth and stimulation. If proper attention is paid to prophylaxis we should have few cases of shock following operation. When it does occur keep the patient warm, elevate foot of bed, relieve pain by morphine if there is no cyanosis. Crile recommends the administration of nitrous oxide and oxygen to relieve pain in cyanotic patients. Transfuse if systolic blood pressure remains below 90 for more than half an hour. Blood transfusion is to be preferred if a suitable donor can be obtained, but when this is not practicable give 500 c. c. of gum-saline solution intravenously. A second transfusion may be necessary. Large quantities of fluids should be given by mouth or rectal drip for the succeeding twenty-four hours. Drugs are unreliable.

Abstracts from Current Literature

Diagnosis and Treatment of Tuberculosis of the Kidneys and Urinary System.—G. Ekehorn (*Hygeia,* July 31, 1922) is of the opinion that the usual course in renal tuberculosis is the following: A primary tuberculous foci of infection develops in the kidney, through direct hematogenous infection from an infected embolus. This area usually spreads to the renal pelvis, causing ulceration of the papillæ. On the ulcerated surfaces and the necrotic tissue beneath them, the tubercle bacilli form in great numbers. Of these many enter the urine in the renal pelvis, and from this urine the other parts of the kidney become infected, including the wall of the calyx and the mucous membrane of the renal pelvis. This infection is superficial and subepithelial in the beginning. From these superficial, microscopic foci of infection some metastatic tubercle travel along the lymph passages toward the cortex and capsule; other ulcerative processes attack the hitherto normal papillæ of the lateral walls or the points of the papillæ. When necrosis has begun in the papillæ the urinary passages may become congested and dilated, and the infection may then spread also through these to the cortex. The ureters and the bladder may also become infected by the urine.

The symptoms of renal tuberculosis usually first manifest themselves in the bladder as cystitis symptoms. The first symptoms may, however, appear in the renal cavity. In exceptional cases there may be no other subjective symptom than that of blood in the urine. Tubercle bacilli may be demonstrated microscopically in most cases (eighty to ninety per cent.) in the urine. In comparatively early cases of renal tuberculosis, they are usually more numerous and therefore more easily demonstrated.

The only treatment is nephrectomy. Disfunction of the second kidney occurs only in the later stages of the disease. For the last ten years the author has made a practice of closing the wound without drainage or tamponage. If it is found impossible to catheterize the ureters, an explorative incision is made into the healthy kidney, and a thorough examination made of the pelvis and upper portions of the ureters by inspection and palpation. If necessary the worst kidney is then removed and both wounds closed and sutured. It is better to do the whole operation in one sitting than to do a two-stage operation. In bilateral renal tuberculosis the worst kidney should be removed. In such cases the other kidney will take upon itself the function of both kidneys.

Postencephalitic Parkinson Syndrome.—E. Westerberg (*Hygeia,* July 31, 1922) reports four cases exhibiting the postencephalitic Parkinson syndrome. In all important details this disease aspect resembles that of paralysis agitans, the most pronounced symptom being rigidity of the muscles. The position of the head and expression of the face were characteristic, the head bent forward and fixed, and the expression of the upper face anxious and restless, while that of the lower face showed indifference. Tremor which is one of the cardinal symptoms of paralysis agitans was present in two of the cases, though not the same as that typical of this disease. In the post encephalitic condition the rigidity seems more particularly marked and localized in the lips, tongue, and throat, and although there are always typical postures assumed in paralysis agitans, these are not usually of the extreme catatonic nature of those often observed in patients during the post-encephalitic state.

The etiology of paralysis agitans has not yet been accurately ascertained and the disease can only be described from this point of view as having its origin in the central nervous system and seems to be localized in the basal ganglia and the subcortical, extrapyramidal tract. At the Paris Congress, Netter offered the hypothesis that the same virus was responsible for both forms of the disease and that previous types of paralysis agitans were only sporadic manifestations of the same disease. He believes the disease to be a protracted, chronic, destructive process in the basal ganglia, of an infectious nature for as long as two years after the acute stage. Urechia was of the opinion that paralysis agitans was nothing but a syndrome that might follow many different diseases, among others lues.

The therapy for the two affections is identical and consists after the failure of organotherapy, in gradually increased doses of arsenic, scopolamin-hyoscin preparations and more recently of nucleic acid sodium together with light sleeping powders. It is also of importance that the patient should be kept in motion as much as possible to counteract the rigidity of the muscles, Löffler in Zürich has experimented with injections of silversalvarsan, and has had only favorable results, but no conclusions can as yet be made, as this treatment is only in its first experimental stage. Prognosis is bad with high percentage of mortality and but little prospect of complete recovery.

Etiology and Pathogenesis of Rickets.—H. Kjerrulf (*Hygeia,* July 16, 1922) briefly reviews the medical theories of this disease from the earliest times up to the present. The classification of rickets as a deficiency disease is refuted by Jundell, who has never seen a case of rickets resulting from malnutrition. This author ascribes the origin of rickets to overfeeding. A decrease in the number of rickets cases was reported during the war with its enforced restriction in diet. Experiments have shown that rickets may develop where the diet is plentiful and rich in vitamines, and where there can be no question of calcium deficiency. Overfeeding may disturb the endocrine functions and so affect metabolism. The assertions of Mellanby based on his experiments on young dogs in which he produced symptoms of rachiti by feeding them on a diet deficient in vitamin A, have been opposed by Hess and Unger who contend that the condition evoked in these animals was scurvy and not rickets, and by Paton, Noel and Watson, who declare the animals were suffering from domestication, i. e., lack of air and exercise. The therapeutic effect of sunlight in rickets was hinted at as long ago as three hundred years before the present writing.

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Derangement of Knee Joint.—P. H. Mitchener (*British Journal of Surgery,* October, 1922) states: 1. That as regards the actual route selected at operation, the transpatellar is the most satisfactory in all respects. 2. That no method of splinting is necessary or advisable to secure fixation of the knee after operation; early movement, combined with electrotherapeutic measures, are beneficial in promoting early absorption of effusions. 3. That the full benefit of the operation is not to be expected for from two and a half to three years after its performance. 4. That those cases where a definite lesion of the intraarticular structure is present give far more satisfactory results (76.6 per cent. in cases of damage to the semilunar cartilage, and 60.9 per cent. in those of loose body) after operation than where no definite lesion can be found (37.7 per cent. with synovial fringes, and only 27.7 per cent. where no lesion is seen at operation). 5. That when nothing abnormal is found on the joint being opened, the best course to adopt is to close the joint without interfering with the intraarticular structures.

On reviewing the whole of the facts set forth in the foregoing article, it would seem that operative interference in cases of internal derangement of the knee is justifiable, if not indeed desirable, in all cases where a diagnosis of a definite lesion of any of the intraarticular structures can be hazarded with any degree of certainty, and where the consequent disability is sufficient to prevent the patients carrying out efficiently their daily avocation.

Sarcoma of Spleen.—Hyman Goldstein (*International Journal of Surgery,* September, 1922) concludes that: 1. While primary sarcoma of the spleen is rare, primary carcinoma is even much rarer, there being only about eight or nine authentic cases. 2. Secondary sarcoma and carcinoma of the spleen are very uncommon. Even in cases of the most extensive dissemination of tumor growth, the spleen escapes metastatic involvement. 3. About sixty-six cases of primary sarcoma of the spleen have been collected by the writer in a thorough search of the entire medical literature. Some of these have been included in this list, with some doubt and hesitation because the writer is not satisfied that they are true primary sarcomata. 4. The diagnosis of sarcoma of the spleen is best made with the aid of the microscope. 5. Early and prompt operation before secondary metastasis occurs is the only hope. Several cases are on record in which the diagnosis was made during life.

Sanitaria for Tuberculosis and Droplet Infection. — C. Flügge (*Schweizerische Medizinische Wochenschrift,* July 13, 1922), on the basis of his own findings and those of his pupils, does not agree with Wolff-Eisner and he asserts that not every phthisic patient disseminates droplets consistently and under all circumstances. Heyman found only fourteen disseminators among thirty-five patients. A moist catarrh with profuse mucus formation and severe spells of coughing must be present in order to disseminate sufficiently fine droplets. The oral mucous droplets are not dangerous, but the mucous droplets from the bronchi are a distinct menace. With slight coughing spells resulting from marasmus and tuberculosis of the larynx (without closure of the glottis), the danger is slight, but the truly dangerous disseminators of droplets are the ambulant, severely sick patients with a fresh catarrh. After studying the statistics and the relative innocuousness of the segregation of phthisical patients in health resorts and in sanatoria, the author emphasizes the fact that the acquired inaptitude and the resistance to infection of the surroundings play a very important part in the prevention of disease, but that nevertheless infections do occur with massive droplet infection. Such infections can, however, be avoided by simple measures of prevention during the act of coughing, such as holding the hand or a handkerchief in front of the mouth, the turning of the head and the maintenance of a sufficient distance from other persons.

Pituglandol for Dwarfism. — E. Bleuler (*Schweizerische Medizinische Wochenschrift,* July 13, 1922) reports that pituglandol produced a normal growth in a noncretinoid boy, twelve years old, who had not shown any signs of growth for one year. Pituglandol was administered in three to four gm. doses daily, at first together with thyreoidin and after one year without it. Thyreoidin alone did not produce any growth. A transient, painful loosening of the teeth was noted after the administration of the pituglandol.

Bismuth Therapy for Syphilis.—P. Wolfer (*Schweizerische Medizinische Wochenschrift,* July 13, 1922) reports that the experimental injection of trepol (an oily suspension of bismuth) showed that the metal is resorbed very slowly and irregularly, so that a saturation of the body with bismuth can easily occur, with the resulting symptoms of intoxication.

Tissue Culture.—Busse (*Schweizerische Medizinische Wochenschrift,* July 13, 1922) showed that round cells may be cultivated from fully developed connective tissue cells in tissue and cell cultures and that these round cells correspond morphologically and physiologically with the cells appearing in the inflammatory processes.

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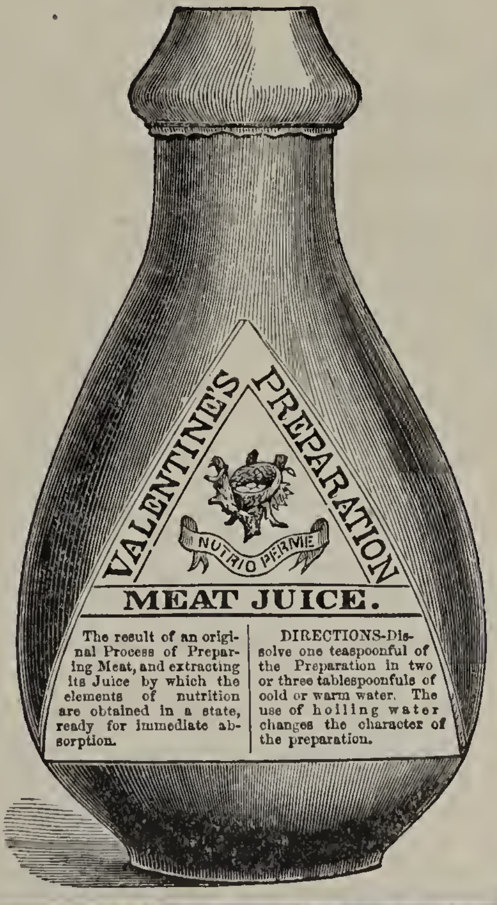

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Pregnancy and Labor in Young Primiparæ.—John W. Harris (*Bulletin of the Johns Hopkins Hospital*, January, 1922) in order to test the correctness of Williams's statement that labor in a girl of sixteen or less is no more serious than in older women, collected and analyzed all labors in girls of sixteen or less occurring in the obstetrical service of the Johns Hopkins Hospital. Five hundred labors in girls between the ages of twelve and sixteen inclusive form the basis of this report. Harris concludes that pregnancy and labor are attended by no greater danger in the young primipara than in the more mature women, and that the duration of labor is actually shorter. As the figures show that the size of the children was not inferior to that noted in older women, and that the occurrence of abnormal pelves is quite as frequent, the result is attributed to the greater elasticity of the soft parts. It would therefore appear from a purely obstetrical view that the ages under consideration were the best for the occurrence of the first labor.

The Care of the Expectant Mother.—At the Congress of the Royal Institute of Public Health, held in Plymouth on May 31st, Dr. Louise McIlroy read a suggestive paper on the expectant mother, in which she showed, according to the *Lancet*, June 10, 1922, that the subject of obstetrics seemed to be merging into the domain of preventive medicine, the care of the pregnant woman being the responsibility of the State rather than that of the voluntary institutions. More investigation of reproduction and child welfare from the normal standpoint as well as from the abnormal and pathological should be undertaken, she thought. At present the whole system of the teaching and treatment in obstetrics was one of chaos and until the whole subject came under complete State control progress would be retarded. Maternity and child welfare was the most important piece of work a nation could undertake. Dr. McIlroy suggested that an efficient supervision of cases of pregnancy would diminish to a great extent much of the present surgical procedure necessary at childbirth. Puerperal septicemia had not appreciably diminished recently. It was more by the supervision of the patient during pregnancy and avoidance of operative interference than by preventive aseptic methods that improvement will be effected. Children born without the aid of operative measures have a much better chance of life than those who have undergone severe delivery by forceps. It is the viability of the child that matters, not its merely remaining alive for a few days while under the obstetrician's care.

Dr. McIlroy advocated the compulsory notifications of all terminations of pregnancy. Until then no positive statements could be made about the death rate before birth. Investigation of diseases such as toxemia will lead to beneficial results, just as in the case of syphilis. Antenatal care will reduce the number of blind and feebleminded and unfit who require life long institutional accommodation. Failure in breast feeding can be prevented by attention during pregnancy to teeth and digestive organs.

Dr. McIlroy suggested as an ideal maternity scheme: 1. The hospital as a centre for treatment, teaching, and research, containing, a, in patient department, with lying in wards, and antenatal beds for observation. Isolation beds for cases of sepsis and obstetrical wards for venereal disease cases. b. Out patient department, with antenatal consultation and postnatal, dental and venereal disease clinics. 2. Infant welfare and treatment. 3. Laboratory for biochemical examinations of urine, blood, etc. Auxiliary aid could be utilized by incorporating the accommodation in hostels and rest homes for expectant and nursing mothers, convalescent homes, home visiting, and registration of patients in attendance. The inspection of pregnant women in industries would lead to a modification of the work, rest hours, and the safeguarding of the mother's interests as a whole.

Dr. McIlroy emphasized the importance of raising the status of the expectant mother and making childbearing easier for married women, who frequently were forgotten in the endeavor to be charitable and generous to the unmarried mother. Compulsory notification of pregnancy was unimportant. Pregnant women will notify their condition to the medical authority when they become convinced of the great advantage of doing so. With regard to midwives, their training lacked opportunity for a study of antenatal conditions. They should have facilities for sending their patients to be examined by specialists when necessary.

Yaws. An Analysis of 1,046 Cases in the Dominican Republic.—W. L. Moss and G. H. Bigelow (*Bulletin of the Johns Hopkins Hospital*, February, 1922). The observations recorded are presented in abstract, and were made by a commission from the School of Tropical Medicine, Harvard University. The paper gives an interesting historical sketch of Santo Domingo, a detailed clinical description of yaws, and the authors' observations on a large number of cases. Neosalvarsan was used in the treatment, with very good results.

Experimental Pigment Cirrhosis Due to Copper.—F. B. Mallory, Frederick Parker, Jr., and Robert N. Nye (*Journal of Medical Research*, October-December, 1921) report that chronic poisoning with salts of copper produces in rabbits within six to twelve months a series of changes which are comparable in many ways with those found in the liver in a chronic disease known in man as hemochromatosis. Probably poisoning with smaller doses over a much longer time would cause lesions in other organs. The authors state that in order to prove that hemochromatosis is due to copper it will require the demonstration of copper either in hemofuscin, or in the liver in excess of the minute amount said to be normally present, or in excretions from the body. If hemochromatosis is due to poisoning with copper there are several sources from which it may be derived, as from its use as a coloring reagent to "copper" vegetables (pickles, canned peas and beans), and to improve the color of absinthe, and from its use to prevent fermentation (beer, wine), or to inhibit the growth of algae (drinking water), and thirdly from distilled liquors (action of acids, chiefly acetic, on copper and brass tubing used in connection with stills). If hemochromatosis is due to chronic poisoning with copper, the present extensive use of crude distilling apparatus in consequence of prohibition is likely to lead to an increase in its incidence.

Constipation in Young Girls and Women—

especially those who spend much time indoors engaged in sedentary pursuits—is almost invariably attended by a retention of waste and toxic substances. Sooner or later these make their way from the bowel into the general system and give rise to a host of autotoxic ills.

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*From Dr. William Scheppegrell's new book on Hayfever and Asthma, Lea & Febiger, Publishers.

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Nursing in China.—At a conference of seven or eight missionary nurses held at a mountain resort in Central China in 1909, the problem of what could be done to further the work of the nursing profession in China was carefully discussed. The Nurses' Association of China soon grew out of that small group of nurses. This association decided all matters regarding salaries, status, examinations, etc., for the whole of this vast country. It presents that much coveted nursing diploma, also a midwifery certificate which is equal to the British C. M. B. More than 300 American and European trained nurses are engaged in medical missionary work in China. Most of these are trained Chinese nurses according to western training school standards. The number of young Chinese nurses who acquire a certificate increases each year. At a recent conference of the Nurses' Association held at Hankow, a number of important forward steps were taken. The granting of an operative midwifery certificate was one of the new measures adopted. This step was taken as a result of the keen realiaztion that something had to be done to lessen the high percentage of infant mortality and deaths among young mothers.

The Spas of France.—The battle of the spas has been joined, says the *British Medical Journal*, June 10, 1922. The principal British spas have formed themselves into a federation, the better to make known to the medical profession and the public their therapeutic merits and social amenities; and they have issued an attractive official publication, *British Spas and Health Resorts.* Inquiries are beginning to be heard about the spas in Germany and German speaking countries; they had an astonishing vogue before the war, and it should be noted that some of the most popular of them are not within the boundaries of the German Reich; Marienbad and Karlsbad are examples. France is also seeking to make its spas better known. Some time ago the French Minister of Public Works constituted a special department in Paris called the Office Français de Tourisme, with branches in Great Britain, in the United States, Spain, and Switzerland.

One of the first acts of this department has been to publish a small album entitled *The Spas of France,* copies of which can be obtained from the office in Great Britain. The volume is beautifully illustrated by excellent photographs of all the principal spas; the particulars given are very businesslike, and include notes on the climate, on the sanitary administration of the place, on its springs and bathing establishments, on the chemical composition of the waters, and on the clinical indications for their use; contraindications are also wisely enumerated. The translation into English has been well done. The majority of the places mentioned are little known in this country; everybody has heard of Aix-les-Bains, Vichy, Vittel, Contrexéville and Plombières, but beyond these spas knowledge is fragmentary; it will be a surprise to many to find that the album contains particulars of eighty-three spas, ranging from the Vosges to the Pyrenees. Probably not everybody knew that Dax, in the Landes, the level country north of the Pyrenees, possesses mud baths, which are considered to be useful in the same classes of cases as those in which the Bohemian mud baths are employed. The mud at Dax, which has an oily consistency, contains a mineral element derived from the alluvial mud of the river Adour, and a vegetable element yielding a rich cryptogamic flora. It also displays natural radioactivity. The amount of space given to each spa is roughly proportional to the merits of the spa and the excellence of its bath houses and installation generally; thus four pages are given to the chief spas, two to those the management of which is less perfect, and one or less to small spas possessing active waters but somewhat insufficient means for their therapeutic application. Before the war an energetic campaign had been undertaken to improve those French spas which stood in need of it; in particular, attention was, at the request of the Académie de Médecine, given to the general sanitation of each town and the purity of its ordinary water supply, as well as to the canalization of the mineral water to prevent contamination. This campaign has been vigorously resumed and great improvements have already been carried out.

Activities of the Rockefeller Foundation.—In a review of the activities of the Rockefeller Foundation, issued recently, the things done by the Foundation during the year 1921, directly and through its departmental agencies—the International Health Board, the China Medical Board, and the Division of Medical Examination—are summarized as follows:

Continued a quarter million annual appropriation to the School of Hygiene and Public Health of Johns Hopkins University.

Pledged two millions to Harvard for a school of health.

Contributed to public health training in Czechoslovakia, Brazil and the United States.

Aided the Pasteur Institute of Paris to recruit and train personnel.

Promoted the cause of nurse training in America and Europe.

Underwrote an experimental pay clinic in the Cornell Medical School.

Formally opened a complete modern medical school and hospital in Peking.

Assisted twenty-five other medical centres in China.

Promised a million dollars for the medical school of Columbia University.

Contracted to appropriate three and one half millions for the rebuilding and reorganization of the medical school and hospital of the Free University of Brussels.

Made surveys of medical schools in Japan, China, the Philippines, Indo-China, Straits Settlements, Siam, India, Syria and Turkey.

Supplied American and British medical journals to 112 medical libraries on the continent.

Supplemented the laboratory equipment and supplies of five medical schools in Central Europe.

Defrayed the expenses of commissions from Great Britain, Belgium, Serbia and Brazil.

Provided 157 fellowships in hygiene, medicine, physics and chemistry, to representatives of eighteen countries.

Continued a campaign against yellow fever in Mexico, Central and South America.

Prosecuted demonstrations in the control of malaria in ten states.

Cooperated in hookworm work in nineteen governmental areas.

Participated in rural health demonstrations in seventy-seven American counties and in Brazil.

Neared the goal of transferring to French agencies an antituberculosis organization in France.

Provided experts in medical education and public health for counsel and surveys in many parts of the world, and rendered sundry minor services to governments and voluntary societies.

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J. R. Wood, M. D., *Physician Sheltering Arms Hospital, Paint Creek, W. Va., U. S. A.:* "I have been using VALENTINE'S MEAT-JUICE in the treatment of Typhoid Fever cases in the Sheltering Arms Hospital, for the last two or three weeks, with the most gratifying results both to the patient and physician. I consider it the best preparation of animal food I have ever seen, in fact, the only one I have ever had any success with."

Dr. Genevaix, *Assistant Surgeon-Major, First Class, Hotel Dieu, Creusot, France:* "The patients to whom I have given the excellent preparation, VALENTINE'S MEAT-JUICE, have found their general condition rapidly improved by it, and in the convalescence from continued Fever (Typhoid and Para-Typhoid) it gives the best results."

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Evidences of Disease in Rhodesian Man.—The last discovered fossil skull, found in 1921 at the Broken Hill Mine in Rhodesia, is now safe in the Natural History Museum, South Kensington, London. An editorial writer in the *Lancet* for June 17, 1922, in commenting on this skull, says that it not only furnishes several curious problems to the anthropologist, but it holds a unique position among prehistoric remains in showing pathological conditions of teeth, ear, and knee. Investigation of the dental and aural conditions, he says, was entrusted by Dr. Smith Woodward to Mr. Sidney Spokes and Mr. Macleod Yearsley respectively, both of whom are keenly interested in the study of prehistoric man. Mr. Spokes has found widespread caries of the teeth, with evidence of extensive alveolar abscesses. These are associated with a condition of the upper end of the tibia suggesting chronic arthritis, and presumably the result of chronic oral sepsis. We believe that we are correct in stating that no such phenomena have been met with before in a skeleton of the age of the Rhodesian specimen, which is considered provisionally as belonging to the late Pleistocene period.

Besides the dental disease, there is a lesion of the mastoid process which is of great interest, the more so because, about two inches above the auditory meatus there is a perforation, ten mm. in its greater diameter, of the squamous bone. This hole, apparently the result of a blow from some sharp implement, shows evident signs of having undergone considerable natural repair. It has been suggested that it is an example of primitive trepanning, but the fact that its internal opening exceeds the external by two mm. negatives such a conclusion, and a comparison with the trepanned skulls in the Wellcome Museum bears this out. Behind the auditory meatus is a large opening in the mastoid, measuring ten mm. in its vertical and fifteen mm. in its horizontal diameter. This is deeply excavated, with pitted walls, and communicates with the cells in the tip of the process, which is of the pneumatic variety. The mastoid tip itself is perforated, the edges of the deficiency being pitted, and those of the partitions dividing the cells noticeably rounded. An examination of the interior of the meatus shows that the posterior tympanic spine and outer attic wall are missing, a significant point which may, however, be due to the cleaning away of the matrix in which the skull was embedded. But these appearances are not all that can be found. Extending from the upper boundary of the hole in the mastoid is a pitted, roughened track which passes across the temporozygomatic ridge, at the weakest part of the attachment of the temporal fascia, on to the squama to a distance of seven mm. below the wound described above, and then turns forward, narrowing to a point. This track measures nine mm. at its mastoid commencement and five mm. opposite the perforation in the squama. The bone between the perforation and the track is smooth and normal, suggesting no connection between the two.

The hypothesis suggested by Mr. Yearsley to account for these remarkable appearances is that this unfortunate Rhodesian man experienced a train of circumstances which are not without modern parallel. The subject of chronic oral sepsis for a period sufficient to start arthritic changes, he probably suffered from a septic condition of his tonsils and pharynx which resulted in middle ear suppuration. The ear condition extended to the mastoid and the mastoid abscess perforated the cortex first near the base of the process. Unable to track downwards because of the strong muscular attachments in a prehistoric male of stout build (he must have been nigh to six feet in height), and heavy skull, the pus turned upwards at the weakest point of the temporal fascia, in the line of least resistance, and burrowed beneath the temporal muscle, turning forward where the tissues surrounding the wound in the squama were thickened pathologically. Later, the mastoid abscess burst through the tip and, escaping under the neck muscles, caused the death of this prehistoric patient.

Infectious Diseases and Starvation.—In an address recently delivered at the Obuchow Hospital in Petrograd, Dr. A. Sternberg gave an account of his observations on the course of acute infectious diseases in that city, where from the end of 1917 to the end of 1919 all the influences injurious to health had become accumulated to an extraordinary degree, says the *Lancet,* for June 10, 1922. Not only were the most essential hygienic requirements such as drainage, closets, public and private baths entirely lacking, but the whole population was suffering from hunger. With the exception of a few dozen persons, no one was able to maintain his caloric equilibrium—in other words, everyone was more or less undernourished. During this period Petrograd was visited by a number of more or less severe epidemics —viz., typhus, typhoid, relapsing fever, cholera, dysentery, influenza, and measles. In spite of the unfavorable conditions prevailing, both clinical observations and statistics showed that the course of acute infectious diseases was not more severe than in previous years; in dysentery and measles only was the mortality much higher than before. Of chronic infections tuberculosis showed no tendency to run a more rapid and unfavorable course as the result of underfeeding than in previous years. Thus the mortality from typhus in the Petrograd hospitals was 9.4 per cent. in 1918 and 11.8 per cent. in 1919, as compared with an average mortality of 12.2 per cent. during the last thirty years. The mortality from dysentery in 1918 was 45.5 per cent. and in 1919 29.5 per cent. as compared with an average mortality of 22.2 per cent. for the last thirty years. Measles in 1918 did not present an epidemic character, and its mortality for that year was relatively low—viz., 10.28 per cent.—but in 1919 there were 2,058 cases with 667 deaths, or a mortality of 34.1 per cent., as compared with an average mortality of 13.3 per cent. for the last thirty years. Dr. Sternberg attributes considerable importance to the premature senescence produced by starvation through changes in the endocrine glands, especially the thyroid and the sexual organs. Not only were amenorrhea and loss of sexual appetite and potency extremely frequent, but there was a great diminution and almost complete disappearance of hyperthyroidism. The effect of this premature senescence was to modify the character of infectious diseases so that, with the exception of measles and dysentery, the illness ran a less violent course than in younger persons.

Hot Weather is always trying to the elderly and debilitated. Fortunately, however, when these patients begin to show the ill effects of Summer heat by a loss of appetite, impaired digestion, frequent attack of bowel trouble, weak and shaky nerves—and a real "heat exhaustion" threatens, many physicians have learned to rely on

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P. McDonnell, *M. B. Hon. Surgeon, Lowestoft and North Suffolk Hospital, Lowestoft, England:* "We have found VALENTINE'S MEAT-JUICE invaluable in cases of shock and collapse of men who have been blown up in their ships by mines and torpedoes. Some of the patients have been severely injured, often for hours before admission here, and VALENTINE'S MEAT-JUICE has been the only food they could retain."

W. S. Tremaine, M. D., *Professor of Surgery, Niagara University; Consulting Surgeon Maternity, Emergency and St. Francis Hospitals, Buffalo, N. Y.:* "I have much pleasure in stating that I have used VALENTINE'S MEAT-JUICE for more than ten years and can testify to its excellence. I know that I have saved lives with it when every other form of nourishment was rejected. It is a most valuable preparation, and I constantly use it."

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Miscellany.

Hygiene of Submarines.—Surgeon Captain C. M. Belli, of the Royal Italian Navy, has contributed to recent numbers of the *Annali di Medicina Navale* an interesting article on the hygiene of submarines. In commenting on this article, the *Lancet,* June 24, 1922, says:

> Captain Belli tells us that all submarines now have a buoyancy greater than ten per cent., and that they are continually getting larger, and are now up to five thousand tons, two hundred and fifty feet long, with a crew of forty, and a surface speed of twenty-five knots; they can submerge in two or three minutes, and sink to fifteen or twenty fathoms, and stay there for twenty-four hours or more; while under water they can travel at fifteen knots. They have a cruising radius of six thousand miles, and can stay away for thirty or forty days. All nations are a little shy of publishing facts about their submarines, but a German submarine, captured in the war by the Italians, had for each man of the crew on an average six hundred cubic feet of air, a large allowance in a ship, but then there was here no chance of exchange of air when submerged, and the great hygienic trouble in all submarines is stuffiness. Carbonic acid increases even to twenty parts to the thousand; there is greatly increased humidity, and much smell of engines, men, food, and paint. According to the season, they may be excessively hot or extremely cold, and there is always the risk of a disaster which may admit sea water to the accumulators and consequently suffocate everyone with chlorine gas thus produced, because all navies but the American fill their accumulators with sulphuric acid; the United States boats use an accumulator, proposed by Edison, with an alkaline fluid; these accumulators are smaller, require less attention, and do not ever give off chlorine, but they are thought to be less effective.
>
> Ventilation is the chief problem and has been attacked in three ways. At first by mere electric fans which circulated the air, and only made the worst part of the ship as good as the best. Then it was hoped to purify the air, removing moisture, as snow, by refrigeration, while it was attempted to remove carbonic acid by soda lime in granules through which the air was passed. But the damp air as it passed changed the soda lime quickly to sludge, and the surface was consequently so much reduced that the action came quickly to an end. It was hoped that peroxide of sodium, which when moistened gives up oxygen, would help, but it must have very careful handling, and that would have required two men to be added to the crew, and for them there was no room. Perchlorate of potassium mixed with charcoal and peroxide of manganese, when heated enough, glows and gives off a great deal of oxygen, but makes too much heat. Then liquid oxygen was tried, but it so quickly evaporates out of the Dewar flasks, in which alone it can be stored, that it, too, proved impracticable, so recourse had to be made to cylinders of compressed oxygen, but they do not help to reduce the impurities already in the air. In the British, Japanese, and German navies ozone was made electrically, but the ozone is made at the expense of the oxygen present, and it is, besides, irritating to the lungs and rusts metallic surfaces and harms the engines. The third method, that used at present, is a true ventilation. The foul air is condensed by a pump into cylinders, while fresh compressed air is gradually allowed to escape from other cylinders, taken on board in harbor. The drier this air when compressed, the better the effect on the atmosphere of the submarine. By this method all hurtful gases are equally reduced, and thus the crew can be maintained in good physiological condition for twenty-four hours or longer. The main oil engines drive the boat on the surface and, on the surface, actuate the electric motors which charge the accumulators; these, when the boat is submerged, drive it, ventilate it, heat or cool it, and do the cooking for the crew.
>
> Food supply presents special difficulties. Little cooking is done on board. In the Italian Navy, where boats are generally at sea for instruction for only a couple of days, the food for the first day is prepared ashore and kept in an icebox. The feeding of the men for the second and subsequent days requires thought, as dry food, even coffee and cheese, are apt to go bad, the atmosphere being so damp; consequently all food supplied must be preserved in tins. Fresh vegetables cannot be used, for to boil them would take too much current and would make the air far too damp. All the cooking that can be undertaken is the warming up of soup or of coffee and milk. As there is little vegetable supplied, the food is concentrated and apt to be unsatisfying, and it has too much proteid and fat; still, as the cruise lasts only for a few days, this does no harm. In practice the meals are: morning and evening, coffee and milk and biscuit; at noon, soup and meat or tunny fish; also coffee in the middle watch. Three and a half ounces of marsala may be issued at the captain's discretion in cold weather. Cheese, butter, oil, and sugar are also issued, and the ration gives in all four thousand calories. Careful examination has failed to show any material alteration in metabolism. No statistics of illness in submarines have yet been published, and the diseases mentioned are those already reported from the British service—dermatitis from petrol and eyestrain from use of the periscope; the latter is being reduced as better lenses are being fitted and the position of the observer made more cemfortable. Surgeon Captain Belli tells us, too, that the men concerned are under the age of thirty-two. He cordially approves the new system for lighting English submarines to which we have already referred. We may conclude that submarine life, though not exactly comfortable, is, at any rate in peace time, not unhealthy.

Etiology of Yellow Fever.—Alfred E. Cohn and Hideyo Noguchi (*Journal of Experimental Medicine,* June, 1921) state that slowing of the heart occurs in monkeys and guineapigs during the febrile period of the experimental infection due to Leptospira icteroides, as in the human being in yellow fever. This also occurred in animals inoculated with Leptospira ictero-hemorrhagiæ. The mechanism of slowing was found to be due usually to slowing of the whole heart. In one instance incomplete heart block was seen, and changes in the ventricular complex occurred four times.

Sluggish Bowel Action in Childhood

is usually due to errors in feeding. Subjecting these fundamentals to the customary careful correction,

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may be administered coincidentally to relieve the immediate condition.

This pure, tasteless and odorless mineral oil—notably free from the greasiness common to such products—has proved of exceptional value as a safe and dependable means of moving the bowels of young children, and this without the griping, straining and after-constipation by which the use of castor oil and other drastic cathartics is so frequently attended.

The constantly-growing number of physicians who prefer INTEROL to any other media in the routine management of constipation in early life is its own best endorsement.

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Dosage in Children

Begin with a half to one teaspoonful, 3 times a day before meals. Increase or decrease dose until one good movement is obtained daily. Then gradually decrease to the point where a small dose at bedtime will maintain this result.

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President American Hayfever Prevention Association.
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Says—

"IF the patient applies for treatment during an attack of hayfever, the pollen extracts are usually ineffective, and a vaccine should be used, these being injected at intervals of one or two days until the severity of the attack subsides."*

The Vaccine used by Dr. Scheppegrell is practically identical with Sherman's No. 36 which is being extensively used in the prophylaxis and treatment of Hayfever.

*From Dr. William Scheppegrell's new book on Hayfever and Asthma, Lea & Febiger, Publishers.

Bacteriological Laboratories of
G. H. SHERMAN, M. D.
DETROIT, MICH.

Health of a Farming Community.—The results of a recently completed special study of the birth and death rates of a typical farming section of New York State, made by the Division of Vital Statistics of the State Department of Health, have just been made public, by the State Commissioner of Health, Dr. Hermann M. Biggs. The rural portion of Cortland County, that is, the county exclusive of the city of Cortland and incorporated villages, was the selected territory. Professor Warren S. Thompson, of the New York State College of Agriculture at Cornell University, who is directing a general economic and social survey of rural conditions in that county, suggested the value of a health survey, and this study resulted. It is the first analysis ever made of the vital statistics of a typical, rural native born American community in this State.

The ten year period from 1911 to 1920 was covered in the survey. The population in this area is regressive, the loss seeming to be largely due to emigration from the farms, for there is a marked natural increase. The mortality rate of the area was found to be very low. When the crude death rate for the ten year period was corrected by adjustment to a standard age population, it was found to be only 10.7, while the death rate for the entire upstate area when corrected in the same manner for the same period was 14.3.

The average birth rate of the district for the same period was 18.2 whereas for the entire rural area of New York State 1913-1917 it was 19.5. The percentage of still births was 3.2; for rural New York it was 3.5. The infant mortality for the ten years was 80, whereas it was 103 for the entire State, ex-

Get Well at Home.—A serious public health problem is the presence in many western states of a veritable army of consumptives, who have gone forth from their homes in a vain search for health. The West has recognized the menace of this condition, but the East is only beginning to wake to it. Many of these tuberculous persons are partly or wholly unable to support themselves, a condition wherein lies the greatness of the burden and the danger of their presence.

Miss Jessamine Whitney, statistician of the National Tuberculosis Association, has recently made a survey of six cities—Colorado Springs, Denver, El Paso, Los Angeles, Phoenix and San Antonio—the publication of which in the *Journal of Outdoor Life* for March reveals how serious this condition is. In the above mentioned cities it was found that a total of 7,319 tuberculous individuals were cared for by municipal agencies during the year preceding the survey. Sixty-three per cent. of all the indigent tuberculous were nonresident and of those classed as residents, all but seventy-three in Denver had originally come in search of health. Seventy-two per cent. of the nonresidents were men and twenty-eight per cent. women; forty-nine per cent. were of foreign birth, Mexicans and Russian Jews leading; one sixth of all the cases fell in the age period from twenty-five to twenty-nine years.

In contrast to the above percentages, and showing that no such problem exists in cities where good treatment is available, is evidence obtained in a control study made recently in Cleveland; here only about ten per cent. of the consumptives cared for at public expense were nonresidents. It was found that six states are largely responsible for the exodus—Illinois, Michigan, Missouri, Ohio, Pennsylvania and New York. More than half of those who had migrated stated that they had been advised by their physicians "to go West."

Perhaps a few of the wealthy suffering from tuberculosis, who are able to pay well for good treatment and a carefree condition of life, can recover their health in the high altitude and the salubrious climate of the Western states, but the majority of people cannot afford these luxuries—and they are not necessary. Suitable employment in the West for such persons is practically nonexistent, and few states have public institutions open to nonresidents. The result is that many, who might have been cured under the proper conditions at home, perish miserably in an alien region. Successful therapy for consumptives consists chiefly of rest, plenty of good food and fresh air, the proper mental attitude, and competent medical care and supervision—and these are available everywhere.

International Association of Medical Museums.—The American and Canadian Section of the International Association held its fifteenth annual meeting in the Army Medical Museum, Washington, D. C., in May, under the direction of the president, Professor James Ewing, of Cornell University. The Exchange Bureau and the Bureau for the Preservation of the Results of Medical Research of the Section of the Association of Medical Museums, were transferred to the United States Army Medical Museum at Washington. They were formerly located at McGill University Medical Museum, Montreal, Can., and the change was made at the recommendation of the Council. The United States Army Medical Department, through Brigadier General Walter D. McCaw, presented a testimonial to Dr. Daniel S. Lamb, assistant and pathologist at the Army Medical Museum from 1865 to 1920. Dr. Lamb's efforts in making the large collections at present in the Army Medical Museum were highly lauded. Officers for the coming year were elected and those honored were as follows: President, Dr. Frank B. Mallory, of Boston; vice-presidents, Dr. Howard T. Karsner, of Cleveland, Dr. Harry Marshall, of University, Va., and Dr. Robert A. Lambert, of Yale University, New Haven, and secretary-treasurer, Dr. Maude E. Abbot, McGill University, Montreal.

Committee on Local Anesthetics.—The American Medical Association has appointed a committee to continue the study of toxicity and fatalities in local anesthesia. Each of the sections of the scientific assembly of the association is represented on the committee, whose composition is as follows: Dr. Elliott C. Cutler, of Boston, representative of surgery; Dr. Henry S. Dunning of New York, representative of stomatology; Dr. Robert A. Hatcher, of New York, representative of pharmacology, and also secretary of the committee; Dr. Robert S. Lamb, of Washington, D. C., representative of ophthalmology; Dr. David I. Macht, of Baltimore, represents medicine; Dr. Emil Mayer, of New York, represents laryngology, and is chairman of the committee; Dr. Charles Norris, of New York, represents pathology, and Dr. Alexander Randall, of Philadelphia, represents urology.

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In **Typhoid, Gastric** and **Other Fevers,** where it is **Essential** to **Sustain** the **Patient** without **Irritating** the **Weakened Digestive Organs, Valentine's Meat-Juice** demonstrates its **Ease** of **Assimilation** and **Power** of **Restoring** and **Strengthening** when **Other Food Fails.**

J. R. Wood, M. D., *Physician Sheltering Arms Hospital, Paint Creek, W. Va., U. S. A.:* "I have been using VALENTINE'S MEAT-JUICE in the treatment of Typhoid Fever cases in the Sheltering Arms Hospital, for the last two or three weeks, with the most gratifying results both to the patient and physician. I consider it the best preparation of animal food I have ever seen, in fact, the only one I have ever had any success with."

Dr. Genevaix, *Assistant Surgeon-Major, First Class, Hotel Dieu, Creusot, France:* "The patients to whom I have given the excellent preparation, VALENTINE'S MEAT-JUICE, have found their general condition rapidly improved by it, and in the convalescence from continued Fever (Typhoid and Para-Typhoid) it gives the best results."

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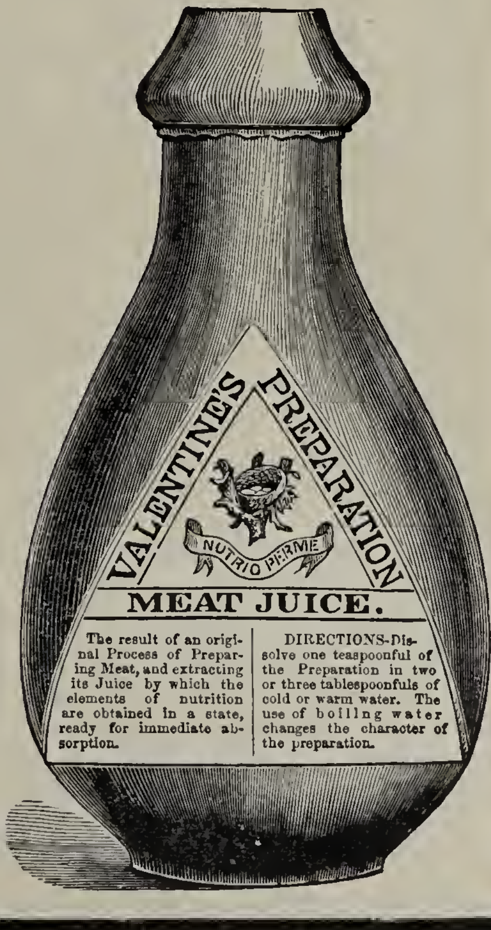
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The result of an original Process of Preparing Meat, and extracting its Juice by which the elements of nutrition are obtained in a state, ready for immediate absorption.
DIRECTIONS-Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

International Epidemiological Intelligence Service.—The International Health Board of the Rockefeller Foundation has entered into a cooperative arrangement with the Health Organization of the League of Nations whereby the board will provide a sum not to exceed $32,840 a year for a period of five years for the purpose of maintaining an international epidemiological intelligence service. The Board will also provide a sum not to exceed $60,080 a year for three years to put into effect a scheme for the international exchange of public health personnel to be conducted under the auspices of the Health Organization of the League.

The Health Organization of the League of Nations was created by the League in September, 1921. Its principal function at present is to conduct an international epidemiological information service and in general to promote international cooperation in the control of epidemic diseases. Incidentally it will advise the league in matters affecting health and cooperate with the International Labor Organization in promoting industrial hygiene.

Since its establishment the intelligence service has kept all governments informed as to the status of epidemics of typhus, intermittent fever, and cholera which have been sweeping westward from the famine stricken regions of Russia. Negotiations among European governments looking to the adoption of sanitary conventions for the control of epidemic diseases have been initiated by the Health Organization and much progress already made. It has also undertaken to promote the international standardization of vaccines and serums.

For the first time in the history of the world there is an agency for taking steps to control epidemics before they get out of hand. The intelligence service of the League of Nations is of vital importance to the people of all countries. It is expected that by the end of the five year period for which funds have been provided by the International Health Board the epidemiological intelligence service will have become so efficient and valuable that the various national governments will regard it as indispensable and provide funds for its further maintenance.

The exchange of public health personnel is expected to reenforce the other activities of the Health Organization by promoting mutual acquaintance, understanding, and good will on which effective international cooperation must be based. Interchange of health officials will be arranged not only for observation but for definite periods of service which will result in actual exchange of experience. The proposed system of exchanges will be put into effect first in Europe and may be extended as opportunity offers to other countries throughout the world.

Changes in the Rockefeller Institute Staff.—The Board of Scientific Directors of the Rockefeller Institute for Medical Research announces the following promotions and appointments:

Dr. Wade H. Brown, hitherto an associate member in pathology and bacteriology has been made a member.

Dr. Homer F. Swift, hitherto an associate member in the department of the hospital, has been made a member.

Dr. Carl A. L. Binger, hitherto an assistant in the department of the hospital, has been made an associate.

Dr. Albert H. Ebeling, hitherto an assistant in experimental surgery, has been made an associate.

Dr. Laura Florence, hitherto an assistant in the department of animal pathology, has been made an associate.

Dr. Albert B. Hastings, hitherto an assistant in the department of the hospital, has been made an associate.

Dr. Philip D. McMaster, hitherto an assistant in pathology and bacteriology, has been made an associate.

Dr. Louis A. Mikeska, hitherto an assistant in chemistry, has been made an associate.

Dr. Ida P. Rolf, hitherto an assistant in chemistry, has been made an associate.

Mr. Fred A. Taylor, hitherto an assistant in chemistry, has been made an associate.

Dr. Hugh J. Morgan, in the department of the hospital, has been appointed resident physician at the hospital.

Dr. David I. Hitchcock, hitherto a fellow in general physiology, has been made an assistant.

Mr. James M. Neill, hitherto a fellow in the department of the hospital, has been made an assistant.

Mr. Henry S. Simms, hitherto a fellow in chemistry, has been made an assistant.

The following new appointments are announced:

Prof. Karl Landsteiner, member in pathology and bacteriology.

Dr. Christen Lundsgaard, associate in the department of the hospital.

Dr. Thomas M. Rivers, associate in the department of the hospital.

Miss Lillian E. Baker, chemical assistant in the division of experimental surgery.

Dr. Edmund A. G. Branch, assistant in the department of the hospital.

Dr. George R. Brow, assistant in medicine and assistant resident in the hospital.

Dr. Harry W. Dahl, assistant in medicine and assistant resident in the hospital.

Dr. Douglas R. Drury, assistant in pathology and bacteriology.

Dr. Geoffry C. Linder, assistant in medicine and assistant resident in the hospital.

Dr. Henry A. Murray, Jr., assistant in the department of the hospital.

Mr. Frederic M. Nicholson, assistant in pathology and bacteriology.

Miss Ida W. Pritchett, assistant in pathology and bacteriology.

Dr. Harold A. Salvesen, assistant in medicine and assistant resident in the hospital.

Dr. Harold J. Stewart, assistant in medicine and assistant resident in the hospital.

Dr. Chester M. van Allen, assistant in pathology and bacteriology.

Miss Helena A. M. Tibbetts, fellow in the department of animal pathology.

Dr. Peyton Rous, member in pathology and bacteriology, has been appointed coeditor of the *Journal of Experimental Medicine.*

Dr. Harold L. Amoss, hitherto an associate member in pathology and bacteriology, has accepted a position as associate professor of medicine at Johns Hopkins Medical School.

Dr. Lloyd D. Felton, hitherto an associate in pathology and bacteriology, has accepted a position as assistant professor in preventive medicine and hygiene at the Harvard Medical School.

Dr. Raymond G. Hussey, hitherto an associate in biophysics, has accepted a position as assistant professor in pathology in Cornell University Medical College.

Dr. Robert L. Levy, hitherto an associate in the department of the hospital, has accepted a position as associate in medicine at the College of Physicians and Surgeons, Columbia University and assistant visiting physician to the Presbyterian Hospital.

Dr. Edgar Stillman, hitherto an associate in the department of the hospital, has accepted a position as associate in medicine at the College of Physicians and Surgeons, Columbia University and assistant visiting physician to the Presbyterian Hospital.

Dr. Goronwy O. Broun, hitherto an assistant in pathology and bacteriology, has accepted a position as assistant in the Thorndyke Laboratory, Boston, Mass., and assistant resident physician at the Boston City Hospital.

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In **Diarrhoea, Dysentery** and **Cholera Infantum,** in the **Wasting** and **Febrile Diseases** of **Children,** and in the treatment of **Weak Babies,** the **Ease** of **Assimilation** and **Power** of **Valentine's Meat-Juice** to **Restore** and **Strengthen** has been demonstrated in Hospitals for Children.

Diseases of Children.

W. T. Watt, M. D., *Director Imperial Medical College, Tientsin, China:* "In cases of Infantile Diarrhœa, which weakens and debilitates a child rapidly, I have found VALENTINE'S MEAT-JUICE a great stimulant and quick restorative of vitality. Three years ago when an epidemic broke out in Tientsin, I ordered my staff to try your MEAT-JUICE, which justified all expectations, having been satisfactory to patients and physicians alike."

Dr. Calatraveno, *Late Physician of the Children's Hospital, Madrid, Spain:* "I have employed VALENTINE'S MEAT-JUICE most successfully in cases of convalescence from infectious diseases, and it is especially beneficial for children suffering from urinary weakness caused by extreme debility, as in every case it acted remarkably in restoring their strength with notable rapidity."

Physicians are invited to send for brochures containing clinical reports.

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The result of an original Process of Preparing Meat, and extracting its Juice by which the elements of nutrition are obtained in a state, ready for immediate absorption.
DIRECTIONS-Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

Miscellany.

Beriberi: Some Facts and the Possible Hypothesis.—Tsang G. Ni (*Journal of Laboratory and Clinical Medicine,* March, 1922) discusses the various theories as to the cause of beriberi, stating that the infectious theory of its origin is no longer tenable, as experiments on its production show. He believes that disturbance of vitamine metabolism is one, if not the only one, factor in the causation of the disease. The following points are brought out by the author: The theory of nitrogen starvation or of phosphorus starvation may be discredited by comparing with the actual requirement. The source of the vitamine in the body might be endogenous as well as exogenous. Muscular or mental strain might increase the vitamine requirement and assist in developing beriberi. Under different conditions vitamine may be labile or stable, active or inactive, so that the same amount of vitamine in the body may not have the same antiberiberic function; also the capability of cells and the utilization of vitamine in the body might be changed, which would have influence on causing beriberi. Many other theories of beriberi etiology, beside vitamine deficiency, can be disproved by experiments. Deficiency in vitamine and deficiency in general nutrition may not always go side by side: beriberi may appear before the general condition breaks down and may not appear after disturbance of general nutrition.

A New Excitant of Typhus?—Augustin Belai (*Wiener klinische Wochenschrift,* April 20, 1922) describes a new organism in the blood taken from a distinct roseola or petechia and from different parts of the body. It is found in all stages of the disease, chiefly in roseolæ two to three days old. In the microscopic examination the source of light is a hundred candle power, a half watt lamp in a holder fifteen cm. high placed at a distinct of fourteen to fifteen cm. from the microscopic mirror. The smallest diaphragm aperture and an open iris are used. The erythrocytes appear in a golden yellow heap in a black yellow background and the spirochetes proceed from these into the dark field, showing motion and colored pale blue. After ten seconds many spirochetes lose their mobility and appear like thin candles with a flame at the free end. With the proper light a capsule and the spiral form are seen. Nearly every spirochete is attached at one end to the periphery or outer third of an erythrocyte. They are never grouped together like the spirochæta pallida and usually point to one side. They vary from a quarter to five diameters of an erythrocyte in length and they are thinner than an erythrocyte; at each end there is a swelling like the Babes-Ernst bodies. Their motion is pendulous—wavy and lasts thirty-six seconds after preparation of the slide. The delicacy of their body and their windings are characteristic and no other spirochete is so attached to the erythrocytes. They are not accidental findings as they occur only in typhus and only in the spots, usually in the second drop aspirated; they are intimately associated with the erythrocytes. Their great stability is shown by the fact that in cases of recurrent typhus fever, the spirochetes of typhus must first overcome the spirochete of recurrent fever, their toxins and antitoxins, the high temperature and probably their own antitoxins as well. The recovery from typhus probably results from the development of sufficient antibodies. The great number of spirochetes produces a great many antibodies, which explains the lasting effect of the immunity for years and in severe cases for a lifetime. This spirochete is called Spirochæta Emiliæ Schestopal after its discoverer.

Relation Between Spermatogenesis and Leucopoiesis in Acute Infection.—Henry E. Meleney and Harold Linsky (*Proceedings of the New York Pathological Society,* October-December, 1920) undertook this study to determine whether the injuries to spermatogenesis so frequently observed in acute infections are correlated with the injury to the leucopoietic function, as shown by absence of leucocytosis. Thirty-eight cases of acute infections, such as lobar pneumonia, influenza, and typhoid fever, were used as the basis of this study. The patients were men within the period of active spermatogenesis. It was found that the proportion of cases showing injury to spermatogenesis increased with the duration of the illness. From the data presented it appears that the duration of the illness is a more significant factor in relation to spermatogenesis than the possible injury to the leucopoietic function. It is stated that acute infection, accompanied by leucopenia, is not more likely to be accompanied by injury to spermatogenesis than are other infections, in which a leucocytosis usually occurs.

Agglutinins in Normal Sera for Some Microorganisms of the Paratyphoid Group.—A. B. Rosher and H. A. Fielden (*Lancet,* June 3, 1922) draw the following conclusions: 1. Many persons yield serum agglutinating Bacillus paratyphosus C, Bacillus aertrycke (Mutton), and Bacillus enteritidis (Gaertner) more among those who received typhoid inoculations than among those who were not inoculated, and therefore more in males than females. 2. The agglutination of the first two organisms is largely due to secondary agglutination from the paratyphosus B element of the triple vaccine, whereas the last mentioned seems to be coagglutinated both by the typhoid and paratyphoid B elements. 3. Practically, if a diagnosis is to be made on a single test, the titre must be much higher than 1/640 for these organisms; a titre of over 1/1,000 is suggestive of infection and one of over 1/2,000 is strongly suggestive, but for accurate diagnosis, it is always necessary to perform repeated tests and to demonstrate that fluctuation in the agglutinin content of the patient's serum, which is recognized as characteristic of infection with organisms of this group.

Intravenous Injections of Hexamethylenamine in Typhoid Septicemia.—Julio B. de Quiros (*Semana Medica,* April 13, 1922) reports having used over a period of four years an isotonic solution of hexamethylenamine intravenously in typhoid. In doses of from one to three grams it is tolerated perfectly and the kidneys and other organs of elimination were only benefited. Sequelæ were absent and the injections seemed especially to have an antiseptic action on the gallbladder. Hemorrhage was not seen in the series of cases reported; the drug is inexpensive, the procedure simple and safe.

Bowel Torpor in the Elderly

is usually the result of a progressive atony of the bowel, with a gradual decrease of the natural mucus and other secretions. The loss of moisture dries the feces and interferes with their free and easy passage. Under such conditions

INTEROL

serves as a safe and efficient substitute for the physiologic secretions. Following its systematic use, the bowel contents are kept soft, the intestinal canal—especially the large intestine—is adequately lubricated, and the feces are passed along and evacuated in due time without straining, pain, or discomfort.

INTEROL thus constitutes an ideal medium for the relief of bowel torpor in patients of advanced age.

DIRECTIONS:

In treating the elderly, begin with a tablespoonful morning and night on an empty stomach, increasing or decreasing as conditions require.

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*From Dr. William Scheppegrell's new book on Hayfever and Asthma, Lea & Febiger, Publishers.

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The Sleep of Elementary School Children.—Malcolm Gross (*Lancet,* April 29, 1922) asserts that the Summer Time Act (in England) has a tendency to decrease the already insufficient amount of sleep for children, thereby damaging their health. They do not get enough sleep in winter and still less in summer. The disadvantages of the Summer Time Act can be overcome by adequate parental control, which should aim to provide longer sleep for children during the whole year.

Control of Rural Typhoid Fever.—A large majority of cases and deaths from typhoid fever occur in rural districts. In the Registration Area of the United States in 1920, the rural death rate for typhoid fever was 9.6 in 100,000 while the rate for the urban population was 5.5. The states leading with the highest typhoid fever death rates are those with a large proportion of rural population—South Carolina, 22.4; Kentucky, 20.2; Mississippi, 18.6; Tennessee, 18.5; Louisiana, 15.5; Florida, 14.6; North Carolina, 12.5. South Carolina and Kentucky have 82.5 and 73.8 per cent. respectively of their populations living in rural districts. The other states listed above also have the bulk of their population in country districts. Concentration of effort, therefore, should be made in rural districts.

A Note on the Sterilization of Surgical Instruments.—Everett S. Sanderson (*Journal of Laboratory and Clinical Medicine,* March, 1922) reports the following results of his experiments on the sterilization of instruments: With nonspore bearing organisms no growth was ever obtained, either on broth or on agar, with glass rods or scalpels which had been burned off with methyl alcohol, even after several days of reincubation. Controls always yielded positive growth. Glass rods and scalpels could not be sterilized by burning them off with methyl alcohol when spores of Bacillus anthracis, Bacillus cereus, Bacillus botulinus, Bacillus tetani, and similar organisms were present. The burning off of such instruments with a methyl alcohol formalin mixture (3:1) gave excellent results except in the case of the anaerobes when grease and oil were present. The conclusion is that when absolute sterility is desired, the burning off of a surface with an inflammable fluid cannot always be relied upon.

Wireless Telephony for the Deaf. — Dan M'Kenzie, in the *Medical Press* for June 7, 1922, reports the experience of a patient who had been deaf for many years. He had employed most of the ordinary electrical hearing apparatus without deriving any benefit whatever. In experimenting with wireless telephony, his hobby, he discovered that by the use of as many as five thermionic valves it was possible for him to raise the intensity of sound to such a degree that he was able to hear distinctly. More surprising still, he noticed that the habitual employment of his apparatus led to a considerable improvement in his hearing for ordinary sounds and speech. The author suggests that this was due to the fact that the exercise of the hearing faculty overcame a certain amount of functional deafness which was superimposed upon his organic lesion. This explanation is based on the observation that the patient's deafness to the spoken voice was relatively greater than his deafness to the tuning fork.

Campaign Against Heart Disease.—Heart disease causes the largest number of deaths annually in the United States (about 155,000), and is the cause of more or less continuous disability among two and a half millions of people, while it is a disease about which we have very little exact statistical information. From the preventive aspect, the campaign against heart disease is in practically the same position as was the antituberculosis campaign at its inception in this country about twenty years ago. The tremendous importance of heart disease as a factor in causing disability, dependence, and death is recognized by all health workers and physicians. They are realizing more and more that heart disease is preventable, and that a final solution of the problem lies in organized intelligent effort. But the first step in such effort must be to build up a mass of information to provide checks against misdirected enterprise. There is no agency or machinery at present for collecting the facts by means of which the campaign against heart disease can be guided.

The Association for the Prevention and Relief of Heart Disease in the city of New York is endeavoring to fill this need. The association has encouraged the development of numerous cardiac clinics in the city, and proposes to keep systematic records in connection with its work. Emphasis is being placed upon a full history in each case.

Investigation of the Virus of Measles.—Andrew Watson Sellards and George Hoyt Bigelow (*Journal of Medical Research,* March-May, 1921) recovered in considerable numbers a small pleomorphic gram staining bacillus in blood culture from twenty-five of thirty-one measles patients, using methods for the inhibition of phagocytosis in the cultures. Five of the twenty-four control individuals showed similar growth, the morphology and staining reactions closely resembling the strains from measles cases, but at least three of the cultures from the controls were proved to be definitely different from the majority of the measles strains by fermentation tests. The latter strains fermented glucose, dextrin, and in some instances saccharose, while three of the five cultures from control cases did not even ferment glucose. The organism produced very mild symptoms in monkeys, and after massive injections invades the tissue and sets up definite though slight lesions in the skin. This, together with its frequent occurrence in the blood of measles patients, is suggestive of its etiological relationship to the disease.

A Correspondence Course for Public Health Nurses.—The New York State Department of Health announces that in cooperation with the New York University and Bellevue Hospital Medical College arrangements have been made to conduct a correspondence course for the training of public health nurses. This course, which is open to all registered nurses, was begun on September 5, 1922, and will call for ten hours weekly study for a period of forty-eight weeks. The course will include instruction in all of the various phases of public health work in which nurses are engaged. It is hoped by this means to increase the number of women qualified for paid positions in the health service of the state.

Hot Weather is always trying to the elderly and debilitated. Fortunately, however, when these patients begin to show the ill effects of Summer heat by a loss of appetite, impaired digestion, frequent attack of bowel trouble, weak and shaky nerves—and a real "heat exhaustion" threatens, many physicians have learned to rely on

Gray's Glycerine Tonic Comp.

Two to four teaspoonfuls in iced water, or on cracked ice, before meals will afford needed support, prevent the depression of bodily functions, and help the aged and weak to withstand the enervating tendencies of hot, sultry weather.

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Dr. R. Sarandeses, *Physician to the Provincial Hospital, Oviedo, Spain:* "I had occasion to use VALENTINE'S MEAT-JUICE on a member of my own family and with excellent results. It is most agreeable to the sick and well, is easily prepared and administered, and for the young anæmic constitutes a superior remedy."

Dr. Lenoble, *Surgeon in Chief, Military Ward of the Hospital D'Argentan, Argentan, France:* "The powerful reconstituent, VALENTINE'S MEAT-JUICE, brought about a great improvement in the condition of the sick and wounded, whose long stay in the trenches had made them particularly anæmic."

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Effect of Iodothyrine and Iodine on the Metamorphosis of Ambystoma Maculatum. — E. Uhlenhuth (*Endocrinology,* January, 1922) states that the administration of inorganic iodine, which produces precocious metamorphosis in tadpoles, has not the slightest effect upon the metamorphosis of salamander larvæ, although iodothyrine causes prompt metamorphosis in the salamander larvæ just as it does in tadpoles. He made this observation in repeating his experiments of some years earlier, by which he confirmed the conclusions then reached. However, while the thyroid gland of salamander larvæ does not function during most of the larval period, nevertheless the gland is present, mature in size and apparent structure, yet evidently not capable of functioning. The assumption seems warranted that hormone excretion in salamanders cannot take place before a certain "releasing mechanism" has developed, the action of which forces the thyroid to give up its hormone. In tadpoles, on the contrary, excretion of the thyroid hormone begins early in larval life, and this explains why the administration of an excess of inorganic iodine can produce precocious metamorphosis in tadpoles while it is completely ineffective in the larvæ of salamanders. In order to cause metamorphosis, iodine must combine with the substances forming the thyroid hormone and the rate of hormone excretion must increase with the increase of iodine available.

Antityphoid Vaccination by the Mouth.—Besredka (*Paris médical,* June 3, 1922) states that while it has been known for some time that antibodies may be present without the existence of immunity, it was not known until recently that sometimes immunity may be produced without antibodies. Various vaccines have to reach in the system the special organs upon which the corresponding germs produce their harmful effects; only under such conditions does the vaccine develop its maximal efficacy. Guineapigs were long believed refractory to vaccination against anthrax because neither intraperitoneal nor subcutaneous injections were successful, but recently it has been found that these animals are very easily immunized against anthrax by injection into the skin itself, which is the structure in which anthrax infection is actually acquired. Guineapigs thus immunized against anthrax show no specific antibodies, the immunity being actually a skin or cutiimmunity. In dysentery, cholera, and the typhoid groups of disorders the organ attacked by the virus is the intestinal ball, and the most direct route of administering the corresponding vaccines is, therefore, by the mouth. Rabbits are easily immunized against dysentery by giving heated Shiga cultures by mouth, without development of antibodies. Nicolle has recently vaccinated two men by the mouth with dysentery cultures sterilized at 76°; fifteen to eighteen days later these two men, as well as two volunteer controls, ingested virulent dysentery germs. The controls developed the disease, while those vaccinated by the mouth did not. Rabbits are refractory to typhoid bacilli given by mouth, but upon previous oral administration of oxgall, some desquamation of the intestinal mucosa results which facilitates the absorption of the virus and leads to the development in these animals of an immunity to typhoid virus injections elsewhere in the body which would not otherwise have been produced. The intestine is the structure to be vaccinated in trying to obtain immunity against typhoid or cholera. The customary subcutaneous injection of antityphoid vaccine is merely a roundabout method of protecting against this disease. Oral antityphoid vaccination has recently been practised by Vaillant in 1,236 persons in certain badly stricken localities in the department of Pas-de-Calais. On three successive days on arising each person took a bile pill and a tablet of heat killed triple vaccine. The reactions were limited to slight colic and headache. Out of 2,000 inhabitants between 600 and 650 escaped vaccination and yielded twenty-nine cases of typhoid before the beginning of the crusade and twenty-one cases after it, constituting altogether about 7.7 per cent. Subcutaneous vaccination was carried out in 173 persons, and was followed by 2.3 per cent. of typhoid cases between the fifth and the twelfth days after the second injection of vaccine. Of the 1,236 persons vaccinated by the mouth only five developed typhoid fever, including three during or on the day after the crusade and two on the tenth day, or only 0.17 per cent. of the entire number.

Paratyphoid.—Albert Herz (*Wiener klinische Wochenschrift,* April 20, 1922) says that the paratyphoid conditions closely resemble typhoid fever clinically but are characterized by certain peculiarities in their course; the special diagnosis is possible only with bacteriological examination of the blood, the roseola, urine, and stool for the specific excitant and may be the immune substances in the serum. Conradi's technic of blood culture has the greatest significance, giving a positive result even in the early days of the febrile period; positive results from culturing of the urine and stool appear only in the second week. The Gruber-Widal agglutination reaction also appears at this time and its value is diminished because of the positive result lasting for two to three months in those immunized; it must be done repeatedly to obtain any information from the rising titer of the agglutination. The prognosis is more favorable and the mortality is lower than in typhoid fever.

The treatment includes careful nursing and a suitable diet, rich in calories, and consisting of milk, rice and farina mush, scraped beef, eggs, potato and vegetable purees, biscuits and white bread. With this diet the results were just as good as with a fluid diet only. Alcohol, with few exceptions, should be avoided. In hydrotherapy only cool packs are given. For diarrhea animal charcoal is given; for obstipation, enemas; for meteorism, the thermophore and the rectal tube are used; for intestinal hemorrhage, absolute rest and starvation and ultimately opium, and as a styptic ten c. c. of a ten per cent. salt solution are given intravenously; for intestinal perforation early operation is indicated. Circulatory disturbances are treated with intravenous infusions with adrenalin. Urotropin, 1.5 gm., is given daily to disinfect the urinary tract. The results from vaccine therapy with typhoid and paratyphoid vaccine, heterovaccine and proteotherapy were as a rule slight. Prophylaxis includes the disinfection of the stools and urine, an early diagnosis and the recognition of carriers by the systematic bacteriological examinations of the stools and urine.

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J. R. Wood, M. D., *Physician Sheltering Arms Hospital, Paint Creek, W. Va., U. S. A.:* "I have been using VALENTINE'S MEAT-JUICE in the treatment of Typhoid Fever cases in the Sheltering Arms Hospital, for the last two or three weeks, with the most gratifying results both to the patient and physician. I consider it the best preparation of animal food I have ever seen, in fact, the only one I have ever had any success with."

Dr. Genevaix, *Assistant Surgeon-Major, First Class, Hotel Dieu, Creusot, France:* "The patients to whom I have given the excellent preparation, VALENTINE'S MEAT-JUICE, have found their general condition rapidly improved by it, and in the convalescence from continued Fever (Typhoid and Para-Typhoid) it gives the best results."

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Miscellany.

Osteitis Deformans (Paget's Disease).—J. Lindsay and R. G. Gordon (*British Medical Journal,* April 29, 1922) report a case of Paget's disease in a man, fifty-four years old, whose father had arthritis and whose two paternal uncles had the same disease. He had an attack of sciatica fifteen years before and four years before he noticed the enlargement of his bones, especially in the head, and stiffness in the left hip. There was no history of traumatism. Nearly all of the bones, with few exceptions, were more or less affected by enlargements. The articular surfaces were free, except the left hip and knee. Ionization of the hip gave him some relief. Pain is not always absent in this disease, as tender points are frequently found on the tibia and skull. The enlargement of the vault of the skull is characteristic and the x rays establish the diagnosis. All kinds of treatment are usually futile.

Detoxicated Vaccines.—David Thomson and Robert Thomson (*British Medical Journal,* May 20, 1922) show that by more efficient methods of detoxication, the average dose of vaccine can be increased at least five times and possibly still more. They aim to reach an efficiency of detoxication, whereby one billion germs (one c. c. of the wet germ mass) may be inoculated at a time, thereby producing greater immunity for a long time and remarkable curative results. It has been shown, experimentally, that massive doses of germ substance must be injected in order to obtain a highly potent antiserum in man. The toxins of the germs tire and exhaust the system and therefore they ought to be eliminated from vaccines. Besides, no antisubstances are formed against endotoxins. In former methods of detoxication, the nontoxic precipitates of the germ substance contained a small proportion of the unaltered toxic germs themselves, and when injected these were responsible for much of the toxic reaction of the socalled detoxicated vaccines. This can be avoided by passing the solutions of each germ fraction through a Chamberland filter before precipitating them, with a result that a tenfold increase in the dose of the detoxicated vaccine is possible. In order to remove the endotoxins, the germs must be entirely disintegrated or autolyzed by chemicals, but certain germs require such powerful chemicals (acids, alkalis, and alcohol) as have a deleterious effect upon the specific antigenic properties of the germ proteins. Therefore a machine was devised which, by means of its cutting and grinding action, has the power of smashing substances into colloidal form, giving five to twenty million cuts in the emulsion a minute. A very fine carborundum powder is added to the watery emulsion, which eliminates the use of any chemicals.

Fragilitas Ossium Associated with Blue Sclerotics in Four Generations.—J. Browning Alexander (*British Medical Journal,* April 29, 1922) reports a case, showing not only blue sclerotics and brittle bones (numerous fractures), but also a macular atrophy and zonular cataract in a boy seven and a half years old, otherwise always healthy. The mother showed very deep blue sclerotics and chronic deafness but no fractures; two sisters showed blue sclerotics and no fractures; the mother's sister sustained seven fractures and she as well as other members of the family had deep blue sclerotics; the grandmother and great grandmother had fragile bones and blue sclerotics. It is generally conceded that blue sclerotics are due to the increased transmission of the color of the pigment and not to any inherent coloring of the sclerotics themselves. According to one theory the mother's deafness might possibly be due to a deposition of calcium salts in the middle ear, relating to the abnormal osteogenetic process.

A Frequently Occurring Deforming Disease of the Vertebræ and Its Relationship to Starvation Osteomalacia. — Richard Hoffmann (*Wiener Archiv für Innere Medizin,* April 5, 1922) made an exhaustive clinical study of these cases and came to the conclusion that this disease picture is an expression of a vertebral disease, genetically related to both osteomalacia and to osteoarthritis deformans. The characteristic symptoms are pain in the affected vertebræ on motion, kyphoscoliosis, spinal nerve root symptoms, the typical puppet and lying down postures, an exquisitely tender point between the sacroiliac symphysis and the posterior superior iliac spine and the spurious sciatic phenomenon (pain on extending the flexed thigh and leg). The differential diagnosis includes scoliotic sciatica, lumbago, tuberculous spondylitis, neoplasm, luetic meningomyelitis and paranephritis; in women, diseases and changes in position of the internal genitals. The treatment corresponds exactly with that of osteomalacia: two to three teaspoonfuls daily of a solution of 0.02 grams of phosphorus to a hundred c. c. codliver oil, also calcium lactate or chloride three grams daily, and nutritious food. In a few cases, all of the symptoms were relieved by five to ten injections each of one c. c. of adrenalin chloride, 1:1,000. In some cases x ray treatment had a markedly beneficial effect on the pains. Immobilization by a plaster corset was useful in individual cases.

Death Following the Administration of Thymol.—Milford E. Barnes, Bangkok, Siam (*Journal A. M. A.,* Sept. 16, 1922), reports two fatal cases following the administration of thymol for the relief of hookworm infestation. The majority of patients treated with thymol show some signs of its toxic action, such as flushed face, slight dizziness, and drowsiness. The symptoms usually disappear rapidly after the administration of the final purge. In some countries the drug is dispensed to the patients, who are permitted to take it in their own homes without medical supervision. This practice is not followed in Siam, where the entire course of treatment is personally administered by the medical officer in charge or by his trained dispensers. These rules have been adopted for the administration of thymol: 1, A preliminary small dose of magnesium sulphate is taken by the patient the evening before treatment. 2, No breakfast is permitted on the day of treatment. 3, At 7 a. m., twenty grains of thymol mixed with an equal amount of lactose is administered in capsule. 4, At 9 a. m., an additional dose of twenty grains of thymol is given. 5, At 10 a. m., a final purgative dose of magnesium sulphate in hot water is administered.

Constipation in Young Girls and Women—

especially those who spend much time indoors engaged in sedentary pursuits—is almost invariably attended by a retention of waste and toxic substances. Sooner or later these make their way from the bowel into the general system and give rise to a host of autotoxic ills.

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To relieve the constipation of young girls and women, give two to four teaspoonfuls of INTEROL morning and night, increasing or decreasing the quantity as conditions require. As the bowels yield to the action of INTEROL, gradually cut down the dose to the least amount that—taken at bedtime — will assure a daily evacuation.

a pure mineral oil of the proper density and viscosity to assure satisfactory lubrication of the intestinal canal, and thus relieve and correct bowel inactivity without the usual disagreeable effects of cathartics as commonly employed.

Besides lubricating the canal, INTEROL renders the feces soft and plastic, thereby promoting their easy passage and evacuation with gratifying freedom from discomfort and distress.

It would indeed be difficult to suggest any more serviceable and agreeable medium for the correction of constipation, with its attending autotoxemic conditions, than INTEROL.

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"IF the patient applies for treatment during an attack of hayfever, the pollen extracts are usually ineffective, and a vaccine should be used, these being injected at intervals of one or two days until the severity of the attack subsides."*

The Vaccine used by Dr. Scheppegrell is practically identical with Sherman's No. 36 which is being extensively used in the prophylaxis and treatment of Hayfever.

*From Dr. William Scheppegrell's new book on Hayfever and Asthma, Lea & Febiger, Publishers.

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The Effect of Habituation to and Intoxication with Arsenic.—K. Ullman (*Wiener klinische Wochenschrift,* May 18 and 25 and June 1, 1922) draws the following conclusions: There is an extensive histologically demonstrable similarity in the changes resulting from the local action of unsaturated inorganic arsenical compounds on the epidemal cells and the prolonged action of inorganic arsenicals, which, in the sense of a hemogenization of cell nucleus and cell plasma of the uppermost cell layers lead to keratoses and multiple epitheliomata. This action has also been observed following the salvarsan series and is explainable as an acute hyperkeratosis produced only by inorganic arsenical remains that were split off. The apparently divergent healing effects of inorganic arsenicals of both series on the organism probably depend on the compensatory effect of the arsenic on insufficient biological oxidation and reduction processes, especially in certain neoplastic and pathological tissues, whereby cell production and simultaneous cell destruction can be produced. Inorganic as well as organic trivalent arsenicals, including the modern complex chemotherapeutic preparations, show a greater activity in the organism, both as regards parasitotropism and organotropism. The most useful types are the Fowler solution, salvarsan for trivalent and arsenate of soda and pentavalent cacodylate and atoxyl.

The therapeutic and toxic effects vary with the method of administration of the arsenicals. The most complete utilization and storing in the body and therefore the greatest therapeutic effect is achieved with parenteral methods; the relatively slightest effect is with the intravenous method, owing to the transient stay of the drugs in the blood and liver, and its effectiveness results only with repetition and increasing doses until a cumulative effect is reached, producing stronger organic fixation and also avoiding arsenic fastness of the parasites. The administration of organic and inorganic arsenicals at intervals stands midway between the two methods. Solutions are more effective than pills. The extent of the elimination of an arsenical in the urine and feces is not directly proportional to the therapeutic effect, especially with the intravenous method. Not only with the internal administration, but also with the intravenous, a slowly increasing dose of the arsenical leads to habituation, as is shown by a symptomless tolerance after frequently repeated doses at short intervals and the maximum dose, or excessive single doses, without producing any signs of a cumulative effect, and also by the euphoria, increase of fat and weight, etc. The fatty necrosis in the liver acini after intravenous administration shows a striking perivasal localization confined to the interlobular vessels in the periphery of the liver acini, at first most prominent in the Kupffer endothelial cells, the centre of the liver lobule remaining fat-free for a long time, which also explains the slight therapeutic effect on the one hand, and the relatively slight toxicity of the same drug on the liver on intravenous administration, as well as on the whole organism.

In arsenic intoxication, the liver and adrenals play an important part. Arsenic is irregularly more organotropic for the liver and mercury is the same for the kidneys. The individual maximum dose, especially when given in series, requires revision with the aid of systematic comparison with the parenteral and internal administration. The general practitioner should be circumspect when giving repeated intravenous injections of toxic substances. For the proper judgment of sequelæ and harmful effects following the administration of chemotherapeutically compounded arsenicals, the results should be compared with similar doses of arsenic as found in the saturated and unsaturated series.

The Peptone Treatment.—A. G. Auld (*British Medical Journal,* May 27, 1922) says that there is no doubt that the sharp reaction to injections of Witte's peptone is caused by the histamine present in the peptone. This reaction after intravenous administration is due to a sudden injurious dilatation of the capillaries and venules, peripherally induced, together with stimulation of smooth muscle. The peptone reinforces the action of the histamine. The intensity of the effect depends on the rapidity of the injection. The reaction to the peptone itself requires some time and is pyrexial in character. Histamine is a degradation product of the amino-acid histidine and acts like a powerful drug; its presence in peptone is a drawback, as it not only may decrease the dose, but it is itself useless in the immunizing process, if not actually harmful. Histamine shock closely resembles peptone shock, but it is shorn of the extensive catabolism of body tissues and incoagulability of the blood; it is also unable to produce swelling of the liver, pyrexia or desensitization. It is occasionally detected in the intestine and it can be swallowed without producing symptoms. If toxic symptoms occur, contamination should be suspected. A satisfactory immunizing process is characterized by a slight leucocytosis, especially of the large mononuclears and by an increase in the hemoglobin and red blood cells.

Demonstration and Testing of Typhoid Function.—F. Starlinger (*Wiener klinische Wochenschrift,* May 25, 1922) endeavored to study the function of the isolated thyroid gland by investigating the blood passing through the gland. As fibrinogen is the first stage in the catabolism of the organic albumin, the fibrinogen content of the blood in the thyroid arteries and veins was determined by refraction, by the sinking velocity of the red blood cells, and by salt flocculation. The results in fifteen cases showed that the dysfunction of the thyroid is due to an abnormal preponderance of synthesis over catabolism and that the catabolism of albumin plays an important part in the function of the thyroid. In the hyperfunctioning thyroid there is a diminution of the fibrinogen as the coarsest dispersion fraction of albumin in the venous blood, which is the reverse condition found in hypothyroidism. The energetic function of the thyroid stands out preeminently—the old hormone becomes a catalytic factor and the specific secretion alters the condition of the albumin colloid in the plasma. By means of qualitatively and quantitatively changed thyroid secretions in the efferent vessels, the author hopes to clarify the physiology and the pathology of the thyroid gland through the observation of the changed conditions of the albumin colloid in the plasma of the efferent vessels as contrasted with the plasma of the afferent vessels.

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J. Mertens, M. D., *A. T. O. Bristol Municipal Tuberculosis Dispensaries, Bristol, England:* "I am pleased to state that the results obtained from VALENTINE'S MEAT-JUICE were very satisfactory indeed in all cases where no other kind of food could be used. It produced excellent results with wounded soldiers suffering from Tuberculosis of the lungs."

Dr. Gouel, *Physician in Chief Villepinte Hospital for Consumption, Paris, France:* "VALENTINE'S MEAT-JUICE succeeds well in cases of Anæmia and in the treatment of Tuberculosis in an advanced stage when the stomach is intolerant."

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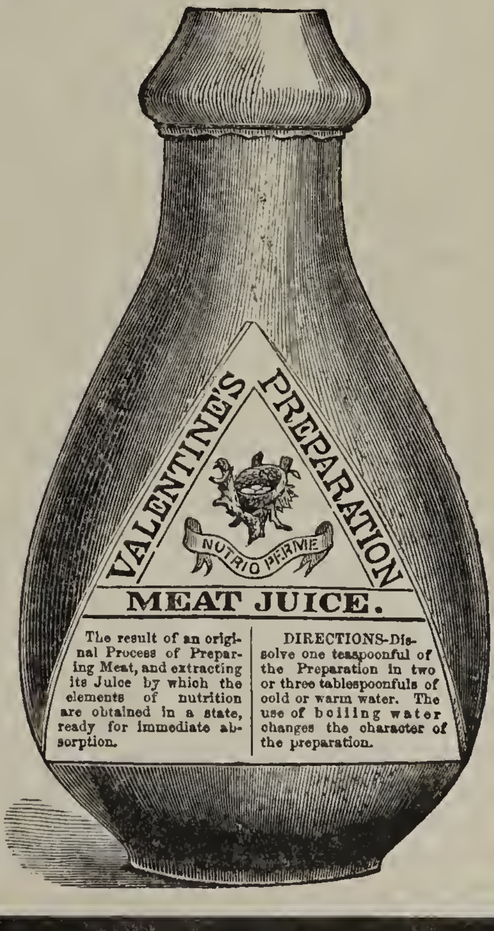

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MISCELLANY

Subacute and Chronic Multiarticular Arthritis.—J. M. H. Munro (*Lancet,* May 13, 1922) asserts that the primary causes of these forms of arthritis are the common and widely distributed species of pathogenic microbes of low virulence, usually of the streptococcus group. The secondary causes are trauma, erosions, chills and exposure, grief and nervous shock, and prostrating and infective diseases. These microbes have a predilection for joint tissues and produce a toxin which has specific effects on the blood and nervous tissues.

Pernicious Anemia, Aplastic or Toxic.—J. F. Rey (*British Medical Journal,* April 29, 1922) reports a case in a man forty-eight years old, who gradually lost weight and showed diarrhea, gastritis, and a generally run down condition. The blood picture was typical of aplastic pernicious anemia except for an anisocytosis: only a few large red cells were found. The relatively excessive number of mononuclears pointed to a bacillary infection (toxic anemia). The diarrhea was checked by astringents and tincture of opium and the gastritis was relieved by hydrochloric acid and the restriction of carbohydrates. Soamin, in doses gradually increased up to the maximum, was injected and 1.5 gm. capsules of betanaphthol were given daily and also hemoglobin. Complete recovery followed.

Recognition and Treatment of Minor Degrees of Fibrositis.—Thomas Marlin (*British Medical Journal,* April 29, 1922) has found that otherwise unexplainable pains in the soft tissues can be traced to some resistance (induration) in a part of a muscle definitely located by the patient, due to a distinct fibrous thickening. The palpation of this spot (massage) immediately lessens the pain, a finding that is characteristic of this condition. Unless the fibrositis is looked for, it can easily be mistaken for something else if other symptoms are present. Owing to the painfulness and contraction of the affected muscle, the antagonistic muscles show awkwardness of movement as a result of the tension to avoid jarring of the painful muscle. The possibility of eyestrain and other sources of irritation or infection must be borne in mind.

The Significance of Discharge from the Nipple in Breast Lesions.—E. Catherine Lewis (*Lancet,* June 3, 1922) states that the determining factor in regard to diagnosis and treatment is the relation of the lesions to the nipple and not to the nature of the lesion itself. There are two groups of cases: 1, that in which the nipple discharge is accompanied by one or more breast swellings, and 2, that in which it is the sole symptom.

The first group includes practically all the spherical celled and duct carcinomas, and also the chronic inflammations with this sign and some of the papillomas; it does not seem as if the discharge itself is of any great value in distinguishing between them. At any rate, there is no particular value in making a clinical diagnosis between two varieties of carcinoma. In the chronic inflammations, the characteristic knotted feel of the gland is usually a safe guide and a small globular swelling in the areola is suggestive of a duct obstructed by papilloma.

In the second group, if hemorrhage really suggests the presence of a malignancy, radical operation should undoubtedly be urged, but a discharge, whether blood stained or clear, from the nipple of an otherwise apparently normal breast is in all probability not due to malignancy and does not require immediate and complete amputation. The proper course is to determine the source of the discharge and to excise that portion of the areola and adjacent tissues, which excised piece is subjected immediately to a thorough microscopic examination (a microscopic lesion may possibly be missed). If its appearance is suspicious, a major operation should be done, but if not, if a discrete papillomatous growth is found, or if no lesion at all is demonstrable, nothing further need be done.

Hypertrophy of Breast.—L. D. Keyser (*Surgery, Gynecology, and Obstetrics,* December, 1921) asserts that massive hypertrophy of the breast is of two types, fibroepithelial and adipose, and that it may occur between the ages of twelve and forty-eight but is most frequently associated with puberty or pregnancy. The normal development of the breast seems to depend on the ovary, and there is evidence which strongly suggests that the massive hypertrophy may be etiologically related to an ovarian malfunction. If spontaneous regression of the process fails to occur, surgical amputation is, at present, the preferred treatment.

Injection of Whole Blood of Convalescents in the Treatment of Influenza.—D. Simici (*Paris médical,* June 3, 1922) states that it is now established that influenza, at least in its severe forms, confers some degree of immunity to subsequent exposure to the disease. A procedure simpler than the administration of the serum of convalescents is the giving of the whole blood by subcutaneous injection. The proteins of the blood other than those contained in the serum are serviceable, besides, in stimulating the defensive processes of the system. The author gave daily subcutaneous or intramuscular injections of ten to twenty mils of blood withdrawn immediately before from the vein of convalescents from influenza of severe septicemic form in whom the temperature had been normal for four or five days. Preference was given to convalescents who had presented complications closely similar to those in the patient to be treated. In withdrawing the blood a large calibre needle was used in order not to give the blood time to coagulate. The blood was then injected into the cellular tissue of the abdomen or buttocks or into the gluteal muscles. The slight pain resulting passed off in one or two days. The injections were nearly always followed in three or four hours by a slight chill lasting fifteen to thirty minutes; two patients had a sharp chill. This treatment was applied in twenty cases of influenza of severe septicemic type, all complicated with more or less extensive lung involvement. Only four patients died. The temperature curve was nearly always favorably influenced by the treatment, failing to rise in the afternoon where the injection had been given in the morning. The final return to normal temperature occurred after two to eight injections. The patient's general condition also nearly always showed improvement and recovery was more rapid. Dyspnea was relieved and pleural complications distinctly prevented.

Sluggish Bowel Action in Childhood

is usually due to errors in feeding. Subjecting these fundamentals to the customary careful correction,

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may be administered coincidentally to relieve the immediate condition.

This pure, tasteless and odorless mineral oil—notably free from the greasiness common to such products—has proved of exceptional value as a safe and dependable means of moving the bowels of young children, and this without the griping, straining and after-constipation by which the use of castor oil and other drastic cathartics is so frequently attended.

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Begin with a half to one teaspoonful, 3 times a day before meals. Increase or decrease dose until one good movement is obtained daily. Then gradually decrease to the point where a small dose at bedtime will maintain this result.

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Relation of Antibody and Antigen to Serum Disease Susceptibility.—George M. Mackenzie and W. H. Leake (*Journal of Experimental Medicine*, May, 1921) studied nineteen patients ranging from thirteen to fifty-six years old, to whom antipneumococcus or antimeningococcus serum was administered for therapeutic purposes, either intravenously or intraspinally, in amounts varying from thirty-four to 630 c. c. Eleven of the nineteen patients gave results distinctly of one type. These were the good precipitin formers who have severe serum disease and get rid of the precipitinogen soon after the symptoms have subsided. Four of the patients were poor precipitin formers, with little or no serum disease, who retained the precipitinogen in the circulation for many weeks and perhaps months. The remaining patients formed a more or less distinct intermediate form. The results lend further support to the conception of serum disease as an antigen antibody reaction.

Spurious Cataract Following an Injury with a Piece of Copper.—Alois Hinger (*Wiener klinische Wochenschrift*, May 25, 1922) reports a case of injury to the eye from a piece of copper as a result of a bomb explosion, showing a peculiar, very characteristic clouding of the lens, and with direct light a gray plate or ringshaped clouding with radial processes (resembling a sunflower), but which is almost invisible with transmitted light. The main symptoms of spurious cataract are: 1, the form of the lens clouding; 2, the varying physical structure of the same in direct and transmitted light, and 3, a peculiar, striking, irridescent opalescence with lateral, concentrated illumination. A direct injury of the lens is not demonstrable, so that this cataract cannot be considered as traumatic, but it is due to a specific change resulting from the presence of copper, as is shown by a chemical examination of the extracted metal, or by the history, the negative result with a magnet and the sideroscope. The clouding of the lens does not occur immediately after the injury as in traumatic cases, but always after a long period of time—usually a year or more, when clouding of the vitreous body and retinal changes in the form of stippling and spots are visible.

The examination with the Sweet apparatus revealed a foreign body ten mm. behind the vertex of the cornea, four mm. below the level of the plane of the horizontal meridian, and eight mm. temporally from the plant of the vertical meridian of the eye. The principle of the Sweet apparatus depends on the parallactic displacement of the foreign body pictures in two exposures in various directions. The repeated attempts to mobilize the foreign body with the Haab giant magnet were absolutely futile and the patient had no pain, which shows that the foreign body did not consist of iron. Although the presence of copper could not be proved in this case, still the characteristic symptoms and the nature of the exploded bomb, together with the behavior toward the magnet, led to the conclusion that this case was the result of injury from a fragment of copper which produced a spurious cataract. As the eye was absolutely unirritated, showing good vision, and as the foreign body was free outside of the very small vitreous body, no attempt was made to remove the foreign body.

Fish Liver Oils and Other Highly Potent Sources of Vitamine A.—S. S. Zilva and J. C. Drummond (*Lancet*, June 24, 1922) state that there is a very marked variation in the vitamine potency of different liver oils; the least potent oil, however, is more active than any other substance containing vitamine A and this very high vitamine content is characteristic of fish liver oils in general. They also found that the soft and hard roe of the codfish has a very high potency; the same may be said of the liver oils of the ling, skate, shark, plaice and pollock, all of which have the same potency as that of codliver oil. The highest potency was found in the coal fish liver oil and the lowest in haddock liver oil. Ox liver was found to be a storehouse of vitamine A in the animal organism. British and Newfoundland codliver oils are just as potent as Norwegian codliver oils. From the therapeutic standpoint, the greater the deficiency of calcium, the more urgent the demand for the fat soluble vitamine, as was shown by comparative tests of the feeding of codliver oil and butter on the deposition of calcium in the bone of growing rats.

Acute Forms of Ossifying and Deforming Diseases of the Vertebral Column.—L. Schmidt and Eduard Weiss (*Wiener klinische Wochenschrift*, June 8, 1922) show that there are diseases of the musculature of the back, associated with an acute onset with rise of temperature, anemia, loss of weight, pains and inhibited motion, which closely simulate diseases of the vertebral column. At this stage the proper treatment is rest and the administration of salicylates, but mechanotherapy and bath treatments are injurious. The conclusions drawn from two cases reported are: 1, vertebral diseases with an insidious onset may be due to an acute focus; 2, this acute or subacute form occurs more frequently than is recognized and many cases can be saved by early diagnosis; 3, the acute onset is characterized by slight rises of temperature in addition to the short course, emaciation and anemia; 4, in spite of the acute symptoms, the treatment should be continuous and consist of rest in bed and salicylates; 5, a premature treatment with baths, mechanotherapy and other irrational ambulant methods may change early cases into incurable forms; 6, convalescing cases should be given energetic bath treatments, followed shortly by appropriate mechanotherapy; 7, the muscular and ligamentous apparatus are involved primarily and later the secondary bone changes set in; 8, this condition can be recognized röentgenographically.

Treatment of Septic Knee Joints.—F. R. Obes (*Journal of Orthopedic Surgery*, December, 1921) concludes as follows: Mobilization will not always replace immobilization, as there are many cases in which mobilization is contraindicated. Careful attention to minor details in adjustment of the splint and bed nursing increases the patient's comfort and resistance. A bent Thomas splint is more comfortable than a straight one and is more easily managed. Slackness and carelessness will always be followed by disaster. Surgical interference should be gentle and precise. Passive manipulation, irrigation at the time of dressing, and frequently changing of dressings all tend to prolong the septic condition.

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If it does what you want it to do as a systemic tonic in overcoming functional weakness and bodily depression, and does it more promptly, uniformly and satisfactorily in case after case, than any other remedy, you will naturally continue to use it. If it fails, you certainly will not.

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Influenza *and* Phthisis.

Dr. Boulland, *Paris, France:* "In an attack of La Grippe accompanied by complete lassitude, I used VALENTINE'S MEAT-JUICE. With this preparation I established an excellent appetite and restored my strength very rapidly."

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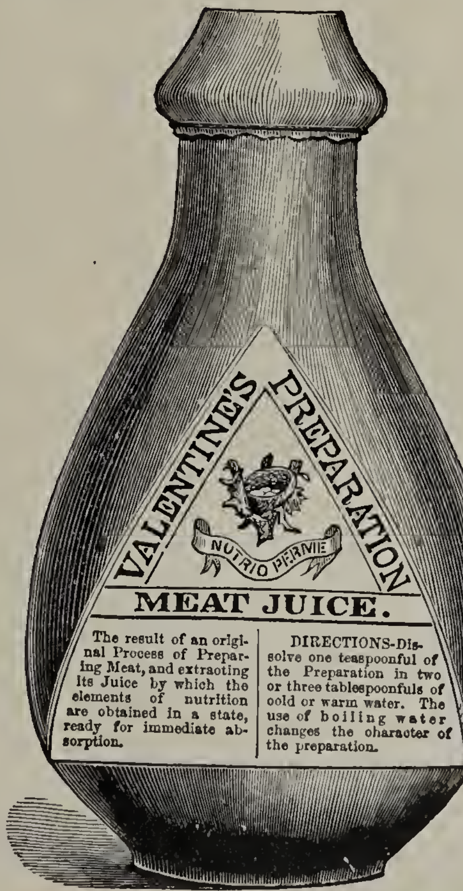

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DIRECTIONS-Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

MISCELLANY

Erythropoietic Action of Germanium Dioxide.—Frederick S. Hammett and Joseph E. Nowrey, Jr. (*Journal of Experimental Medicine,* April, 1922) state that the erythrocythemia produced by the injection of germanium dioxide solution takes its origin from a stimulation of erythrocyte formation in the bone marrow. A histological study of the livers of the test animals showed capillary dilatation and that more erythrocytes were in these capillaries than were in those of the controls, but there was no evidence of red cell formation by the liver. The spleens of the test animals showed slightly more congestion and more deep concentration of the cells in the Malpighian corpuscles than those of the controls, but no evidence of increased red cell destruction nor of splenic erythropoiesis. Using as a criterion of erythropoiesis an increase in the number of erythrocytes in the circulation, which is accompanied by an increase in the number of young red blood cells, and an increased number of nucleated erythrocytes in the bone marrow, the writers reached the conclusion that germanium dioxide is a potent erythropoietic agent and the source of the erythrocythemia produced by this compound is the increased production of red cell precursors by the bone marrow stimulated to increased activity by the compound used.

Carbonic Oxide in Tobacco Smoke.—Henry E. Armstrong (*British Medical Journal,* June 24, 1922) found that sulphuretted hydrogen and prussic acid are both constant products of smoking tobacco. The effects of smoking tobacco are largely dependent upon the concentration of the smoke in air: about eighty per cent. of air in excess is drawn through a cigarette and only about fifty per cent. through a pipe, whereas in a cigar it is only thirty per cent., the proportion of carbon monoxide to the dioxide being 1:2.3. The proportion of carbonic oxide in the smoke varies according to the rate of smoking and a cigarette contains between 0.5 and one per cent. of carbon monoxide. In the case of cigars, the results are little affected by its make or quality, but the closeness of packing and the rate of smoking seem to be the determining factors. The cigarette smoker usually inhales the smoke, whereas the pipe and cigar smoker does not. The carbonic oxide absorption by the blood varies in different individuals.

Results of Venereal Disease Control.—According to the *Statistical Bulletin,* June, 1922, figures for industrial policy holders of the Metropolitan Life Insurance Company during the last four years show a decrease in mortality rates for the venereal diseases. Since 1917 the rate for syphilis, locomotor ataxia, and general paralysis of the insane, has declined twenty-one per cent., the figure for 1921 being 13.1 in 100,000 as compared with 16.6 in the earlier year. It is interesting to note that while there was a considerable increase each year from 1911 to 1917, there has been a sharp drop since then. This change is even more significant in view of the fact that reporting is more accurate on death certificates. The decline, therefore, has been accomplished in spite of better reporting. The decline seems to be most decided in the case of syphilis rather than for locomotor ataxia. The figures indicate that the difference between the rates for 1917 and for 1921 is chiefly accounted for by the lowering of the rates in the age period between twenty-five and fifty-five years. This improvement may be due to improved methods of treating syphilis as well as to the various measures of control established during the war by private agencies acting in cooperation with the government.

Total Nitrogen and Residual Nitrogen in Edema Fluid.—Rudolf Strisower (*Wiener Archiv für Innere Medizin,* April 5, 1922) showed that the residual nitrogen content of edema fluid runs parallel with the total amount of albumin. The low values of the residual nitrogen fluctuate between 0.02 per cent. and 0.05 per cent. and the values above 0.06 per cent. indicate an increase. An increase of the residual nitrogen in the edema fluid was found in cardiac insufficiency, sclerosis of the kidney and in chronic parenchymatous nephritis. As a rule, the amount of residual nitrogen in the edema fluid exceeds that of the blood. No direct relationships between uremia and increase of the residual nitrogen in the edema fluid could be demonstrated.

Studies on the Water Test.—I. Daniel and F. Högler (*Wiener Archiv für Innere Medizin,* April 5, 1922) showed that the counting of the erythrocytes, under certain conditions and under simultaneous control by determining the viscosity of the total blood, is up to the present time the best method of determining the fluctuations of concentration of the blood after the ingestion of water. After drinking large amounts of water under normal conditions, there rapidly ensues a hydremia, which provides the adequate stimulation for the water excreting function of the kidney. The hydremia is induced mostly by a hyperplasmia and to a lesser extent by a hydroplasmia and hydroglobulia. In pathological conditions, the authors' modification of the test enables one to determine, 1, whether and how much water is actually retained; 2, whether the retained water is located in the blood or in the tissues, and, 3, whether a water excreting disturbance of the renal function, or a tendency to edema, or both, are present.

A Prophylactic Malpractice.—L. Stein (*Wiener klinische Wochenschrift,* May 18, 1922) asserts that every kind of correction, no matter how gently done, should be avoided in those cases of stuttering seen in children two to four years old or possibly earlier, in which single words or syllables are repeated, being especially prominent when they wish to relate anything quickly or in a state of excitement. This form of stuttering is due simply to the fact that they repeat a single word or syllable until they find the next word and is due merely to an inadequate vocabulary. Usually it disappears after a short time. The prophylaxis consists of using a slow manner of speech when telling children any stories, so that they unconsciously imitate it in their speech. They should also be kept from any opportunity of speaking of things for which they have no adequate vocabulary. In cases of clonic stuttering, every kind of correction must be absolutely avoided as the correction only serves to attract attention of the children to this impediment and thereby aggravates the condition by making them nervous and selfconscious.

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Pneumonia and Influenza.

William H. Peters, M. D., *Admitting Physician, Camp for Consumptives, State of Rhode Island, Providence, R. I.:* "VALENTINE'S MEAT-JUICE was the only nourishment retained by my five-year old daughter during an attack of Pneumonia. I consider that it saved her life and believe it to be the best product of its kind."

Cavalier Dr. Enrico Ballerini, *Late Surgeon to the Hospital of Rome, Italy:* "I have used VALENTINE'S MEAT-JUICE in the treatment of patients, and also personally, after having been very ill with Influenza, and I must say it is an excellent tonic in conditions of great organic weakness. It is also very agreeable. I have prescribed it with the greatest satisfaction for convalescents and invalids restricted to a liquid diet."

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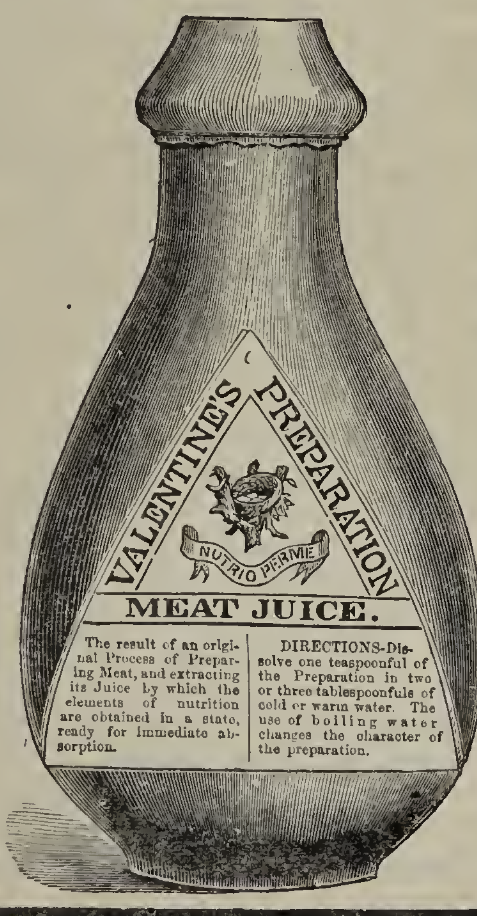
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MISCELLANY

Experiences with Pregl's Solution in Laparotomies.—E. Vogt (*Zentralblatt für Gynäkologie,* June 10, 1922) found that there were no disadvantages in the use of Pregl's iodine solution for prophylactic purposes in 135 laparotomies and that peristalsis of the bladder and intestines was not disturbed. Necropsies done several days after the operation showed no injuries in the serosa which might be attributed to the injurious effects of the iodine solution. At the same time he was not convinced of any specially apparent advantages to be derived from it, but he thinks that the trial of this remedy ought to be extended.

Pancreatic Extracts.—F. G. Banting and C. H. Best (*Journal of Laboratory and Clinical Medicine,* May, 1922) prepared extracts from the pancreas of the bovine fetus at about the fifth month, intravenous and subcutaneous injections of which markedly reduced the percentage of blood sugar and the daily urinary sugar excretion of depancreated dogs, such injections enabling one dog to live for seventy days. The authors state that the active (antidiabetic) principle of such extracts is destroyed by boiling in strongly acid reaction, but it is not affected by the presence of tricresol, which may therefore be used as a preservative. The depressor action of the extract is shortlived.

Acute Pancreatitis.—Daniel Fiske Jones (*Boston Medical and Surgical Journal,* March 16, 1922) says that experimental and clinical findings lead us to believe that there are probably two types of acute pancreatitis, with quite different etiology: a, interstitial pancreatitis due to infection of the interstitial tissue, the infection coming frequently from the biliary system; b, pancreatic necrosis, a necrosis of the parenchymal cells, due to retrojection of bile into the duct of Wirsung or duodenal contents into the duct of Santorini. The treatment of the interstitial type, due to infection from a cholecystitis, is cholecystectomy. The treatment of pancreatic necrosis is drainage of the fatty capsule of the pancreas, and the pancreas itself. In addition, if the condition of the patient will permit, either the sphincter of Oddi may be cut, a choledochostomy or cholecystotomy done, depending upon the condition of the patient and the condition of the gallbladder and ducts found at operation.

Cases of Diphtheritic Colitis in Veterbral Injuries.—W. Goldschmidt and A. Muelleder (*Wiener klinische Wochenschrift,* June 8, 1922) report five such cases in a series of forty-seven observed, including one in which laminectomy was done. The etiological factors are peritoneal and retroperitoneal hematomata, vasomotor and vasoparalytic injuries. One case showed paralysis of the bowel after the injury and profuse diarrhea after a laminectomy. Another case revealed multiple hematomata of the intestinal wall at necropsy, on the bases of which thromboses and disturbances of nutrition develop, which form points of attack for pathogenic bacteria of the intestinal flora, leading to colitis. The last three cases showed bloody mucous stools after fracture of the first lumbar vertebra and sacrum and acute dysentery after fracture of the tenth thoracic vertebra.

Postoperative Adhesions in the Abdominal Cavity.—A. Mayer (*Zentralblatt für Gynäkologie,* June 10, 1922) investigated the question of how often adhesions developed after intraperitoneal interference. He collected sixty cases of relaparotomies, in which the first operation was always done for gynecological conditions and the second usually for such. Adhesions were found in eighty-seven per cent. of the cases: in thirty-seven cases in which the patients were operated upon once outside of the hospital, adhesions were present in one hundred per cent.; in twenty-three cases, in which the patients were operated upon once within the hospital, adhesions were found only in sixty-five per cent. of the cases. The adhesions are somewhat rarer after gynecological operations than after extensive surgical procedures and much more frequent than after slight surgical interference. The reasons for this great difference between the adhesions formed in patients operated upon within the hospital and those without it are largely due to deficient asepsis, hemostasis and peritonealization of stumps. There is no evidence for believing that there is a predisposition to the formation of adhesions. Adhesions may be avoided by the abandonment of 1, painting the skin with iodine; 2, the pouring of humanol into the peritoneal cavity, and 3, pneumoperitoneum. The diagnosis of postoperative adhesions is not easy as they may cause no inconvenience. Pneumoperitoneum may be a distinct aid in the diagnosis and the findings may be corroborated with a röntgenogram. Adhesions are recognized by the bands stretching across the peritoneal cavity.

Diagnostic Value of Gastric Fractional Test Meals.—Hugh S. Pemberton (*British Medical Journal,* July 1, 1922) reports his findings in over two hundred fractional test meals in patients suspected of having abdominal lesions, normal cases, and in patients with extraabdominal conditions, given for the purpose of determining the factors which modify the time—acidity curve of gastric secretion. He found that, 1, the rate and nature of the secretion depend upon the amount of chemical or psychic stimulus affecting the gastric mucosa; besides these two factors, the rate and amount of secretion are a property of the particular gastric mucosa tested. 2. The rate of evacuation of the stomach contents shapes the curve after the pylorus has opened sufficiently; its effect on total acidity may differ from that on the free hydrochloric acid content; taken alone, its most potent effect is exhibited in the time-acidity curve of duodenal ulcer with hurry and also in the curves seen in pyloric obstruction, where this factor is in abeyance. 3. The rate of neutralization or dilution from intestinal regurgitation is associated with the preceding factor, both depending upon the opening of the pylorus, except in gastrointestinal or gastrocolic fistula, as shown by the presence of bile or trypsin in the stomach; the rate of neutralization and of dilution are determined by total and inorganic chloride fractional estimations.

Six types of curves are exhibited, showing the relationship between the total acidity curve, the rate of gastric secretion, the rate of evacuation and the rate of intestinal regurgitation. The fractional test meal method can be favorably compared as regards reliability with the röntgenographic method.

Bowel Torpor in the Elderly

is usually the result of a progressive atony of the bowel, with a gradual decrease of the natural mucus and other secretions. The loss of moisture dries the feces and interferes with their free and easy passage. Under such conditions

INTEROL

serves as a safe and efficient substitute for the physiologic secretions. Following its systematic use, the bowel contents are kept soft, the intestinal canal—especially the large intestine—is adequately lubricated, and the feces are passed along and evacuated in due time without straining, pain, or discomfort.

INTEROL thus constitutes an ideal medium for the relief of bowel torpor in patients of advanced age.

DIRECTIONS:

In treating the elderly, begin with a tablespoonful morning and night on an empty stomach, increasing or decreasing as conditions require.

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Gas Cysts of Intestine.—C. E. Swanbeek (*Annals of Surgery*, May, 1922) from the consideration of a case, concludes that an ulcer at the base of the appendix was undoubtedly the portal through which the gas entered the layers of the cecum and the ascending colon. Whether or not the infection was secondarily to tonsillar infection should be given due consideration. Treatment consists in the removal of the cause, if possible, although simple exploratory laparotomies have caused complete cures. Resection or short circuiting of the afflicted area, with the removal of the primary focus, seems to give best results.

Hepatic Extract (Soluble) as a Remedial Agent.—A. L. Levin (*Southern Medical Journal*, March, 1922) considers hepatic extract (soluble) to be a useful agent to stimulate liver function unless the damage is beyond repair. It must be used for a long period until definite good results have been obtained. It is of value in conjunction with nonsurgical drainage, but has no power to influence pancreatic pathology. It can be used as a diagnostic agent to determine the hepatic origin of the trouble. Liver enlargements due to biliary stasis can be diminished in size in a reasonably short period if used in conjuction with nonsurgical drainage. This includes catarrhal jaundice. The injection does not give rise to any unpleasant reactions.

Conservation of the Gallbladder.—F. W. Parham (*New Orleans Medical and Surgical Journal*, April, 1922) makes a strong plea against removal of the gallbladder except when very strongly indicated, and concludes with these words: "Instead of saying that the gallbladder should always be removed, except when contraindicated by the operative risk, I desire to reverse the formula and say the gallbladder should only be removed on account of definite crippling pathology which will preclude restoration to useful function, for the removal of the gallbladder changes physiological relations, which should never be done without adequate reasons."

Acute Intestinal Obstruction.—D. P. D. Wilkie (*Lancet*, June 10, 1922) states that in order to reduce the still excessive mortality from intestinal obstruction, earlier diagnosis and more prompt surgical treatment is necessary; when in doubt, an exploratory laparotomy is much safer than delay. The types of obstruction are: 1, simple obstruction of the intestinal lumen in its continuity, as from a gallstone, pressure by a band, or from stenosis of the lumen; 2, isolated closed obstruction of an intestinal segment without interference of the circulation, as acute obstruction of the appendix; and 3, obstruction of the lumen plus interference with the circulation, as in strangulations of various sorts.

In the last group the most rapidly fatal cases are those with interference of the venous return flow and with the arterial supply obstructed incompletely. In these cases the toxic absorption cannot be excluded but it is not the chief cause of the fatal ending. Early surgical intervention is most urgent and the shock and toxemia must be combatted with free doses of morphine, subcutaneous injections of saline, and a gas oxygen anesthesia. The author's experiments in cases of the second group showed that the putrefactive changes under and leading to tension within the affected loop of gut are the most important factors of fatality in the toxemia; if the patient survives the toxemia, gangrene with perforation of the loop is the fatal factor. In the first group dehydration is an important factor, especially with a high obstruction, and therefore the loss of fluid should be made good by subcutaneous salines with glucose in all operations; in addition, a potent toxic body of the nature of a proteose is absorbed. Experiments showed that the toxicity of the contents of the obstructed loop of gut is not so great but that its infectivity is great and therefore the routine practice of emptying the distended gut should be done only when absolutely necessary, in which case the high jejunal coils should be drained. Repeated injections of pituitrin, followed by enemas, prevent the stasis and retention in the jejunum after the obstruction below is relieved.

The acute obstruction in peritonitis is frequently due to obstruction in the pelvis and it may be successfully treated either by enterostomy or by a free abdominal opening, separation of the adhesions, pouring into the peritoneal cavity an oily substance (sterile petrolatum) to prevent readhesions and the administration of pituitrin. In acute obstruction from tumors of the colon, acute symptoms supervene on a chronic obstruction. The poor general condition of these patients allows only a simple cecostomy to be done for drainage, until the bowel is emptied. The medical treatment indicated above gives excellent results. Intestinal obstruction is also associated with a definite impairment of renal function, as measured by the nonprotein nitrogen content of the blood; this renal impairment is proportional to the degree of intoxication and serves to determine the prognosis.

Bacteriology of Gallbladder.—J. G. Drennan (*Annals of Surgery*, October, 1922) presents the following conclusions: In a series of one hundred gallbladders removed at operation only nineteen per cent. contained fluid infected with bacteria; the infecting organisms were Bacillus coli in twelve per cent. of the cases, a staphylococcus in four per cent., a streptococcus in two per cent., and a nonpigment forming Sarcina in one per cent. The probable reason there is not a higher percentage of infected gallbladder fluids is that the contained fluids have a concentration of bile too high, for bacteria will not grow satisfactorily if more than seventy per cent. of bile is present. In the nineteen per cent. of infected gallbladder fluids the concentration of the normal bile had been lowered by inflammatory exudates, thus permitting the growth of bacteria in the fluid contents of the gallbladders.

Strangulated Direct Inguinal Hernia.—E. E. Hughes (*British Medical Journal*, May 20, 1922) reports a case in which the strangulation resulted simultaneously with the origin of the hernia, by the formation of a slit in the medial portion of the posterior wall of the inguinal canal (conjoined tendon), which allowed the protrusion of a knuckle of gut, covered by a layer of parietal peritoneum, into the inguinal canal. The tendon of the conjoined tendon tended to approximate the edges of the split and this prevented the reduction of the hernia and also imperilled the blood supply of the herniated gut, resulting in strangulation. This is a rare occurrence.

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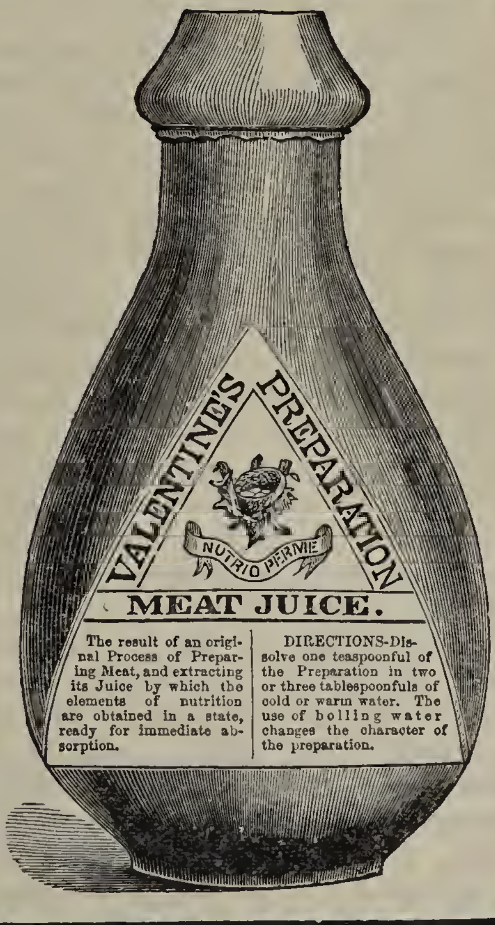
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Perforation of the Living Child or Extraperitoneal Cæsarean Section?—After reviewing two hundred cases of extraperitoneal Cæsarean sections, Otto Küstner (*Zentralblatt für Gynäkologie,* June 4, 1922) compares the value of this method of operation with the operations of embryotomy. Since he adopted this method of treatment, fourteen years ago, no living and no apparently markedly endangered child has been perforated and therefore the latter procedure is unnecessary. The maternal mortality with the preferred operation is lower than with the perforating procedure: of over two hundred patients which were delivered by extraperitoneal Cæsarean section, only two died of sepsis—a mortality of less than one per cent. This operation should be attempted only in hospitals.

A Wandering Silk Suture Removed from the Urethra as a Sequel to Cæsarean Section.—Gordon Luker (*Lancet,* April 29, 1922) raises the point as to whether silk should be used to suture the uterus with the lower segment incision. In the case reported a continuous silk suture was used for the deep muscle layers, which was then buried by a continuous chromic catgut suture. Uneventful recovery followed. About seven months later a piece of silk suture three inches long was found protruding from the urethra and removed. The buried suture evidently wandered into the bladder where it retained its attachment. The free portion was therefore cut off. There were no symptoms.

The Transperitoneal Cervical Cæsarean Section.—Louis E. Phaneuf and Joseph G. Hegarty (*Boston Medical and Surgical Journal,* June 1, 1922) describe the technic of this operation in the following words: The abdomen is prepared and the patient is catheterized; she is then etherized and placed in a moderate Trendelenburg position. The operator stands on the left as in the average pelvic operation; the incision which is median and about five inches long, starts at the symphysis and extends toward the umbilicus; the parietal peritoneum is opened in the median line, exposing the bladder and the lower uterine segment (intestines are practically never seen). The uterine peritoneum just above the bladder, where it is loosely attached, is incised to the uterine muscle; the index finger is introduced in the opening and the bladder is separated from the uterus; the finger is then directed upward and the peritoneum is separated from one side of the uterus, the procedure is repeated on the opposite side. The visceral peritoneum is then incised in the median line to within an inch of the upper limit of the incision in the parietal peritoneum, and the two layers of peritoneum—parietal and visceral—are united by carefully applied interrupted catgut sutures, six to eight in number. The bladder is held under the symphysis by means of a retractor and an incision is made in the cervix (an incision large enough to deliver an ordinary sized child may be made entirely in the cervix, without encroaching on the corpus); the child is usually delivered by the vertex, using the obstetric forceps to assist in the delivery. The placenta and membranes are extracted, a large strip of gauze is packed in the uterus, and 1 c. c. of pituitary extract and of aseptic ergot are administered. The cervical incision is closed with interrupted sutures of No. 2 chromic catgut, and the strip is removed before tying the sutures: the uterus is usually contracting well at this time. After sponging out the uterine incision, the peritoneal layers are further approximated by a continuous suture of No. 0 chromic catgut. As may be seen, the uterine incision is now entirely out of the general peritoneal cavity, and covered almost entirely by the bladder; the conjoined layers of peritoneum are united in the median line by two or three interrupted catgut sutures, and the abdominal wall is closed in the usual manner. The layers of peritoneum are adherent in the course of a few hours; uterine sepsis usually is apparent at the end of twenty-four to forty-eight hours, as shown by the rise of temperature and pulse, at this time, in infected cases. If infected, lochia seeps through the uterine incision; it can be drained readily through the lower end of the abdominal wound without coming in contact with the general peritoneal cavity.

Little's Disease Following Cæsarean Section.—Robert Tauber (*Wiener klinische Wochenschrift,* June 1, 1922) reports such a case because this disease is usually attributed to trauma during birth. The mother showed evidences of rachitis and her pelvis showed a true conjugate measurement of eight cm. As the fetal heart sounds became markedly slowed and the mother desired a living child, a Cæsarean section was done. On the following day the child was found rigid, like a board, and all passive motion was resisted by the uniformly tense musculature, the lower extremities being involved most of all. The skull was asymmetrical, the left parietal bone being more prominent than the right, which could not be attributed to a tumor or cephalhematoma; the fontanelles were very tense and the whole picture was that of an intracranial hemorrhage. A lumbar puncture revealed a yellow discoloration of the spinal fluid, due to diffusion from hemorrhage not in direct communication with the spinal fluid. Eventually the child recovered entirely.

It is usually assumed that the skull is compromised the most during the expulsion of the fetus in labor and therefore all birth traumas are attributed to this stage of the birth. In this case the pressure effect could have been exerted only in the early stage, as from pressure of the head against the symphysis, or from overriding of the cranial bones, resulting in rupture of the veins which enter the great cerebral sinus through the pia or in the course of their exposure between the dura and arachnoid. The author believes that the Cæsarean section had absolutely nothing to do with the Little's disease following it.

Morphine Therapy in Puerperal Eclampsia.—Victor do Amaral (*Revista de Gynecologia e d'Obstetricia,* Rio de Janeiro, April, 1922) reports fourteen cases of puerperal eclampsia seen in his clinic in the past year. Of all treatments he has found the injection of about twenty cgm. of morphine to be the most efficacious, this dose may be increased to forty or even fifty cgm. The effect of the morphine is seen in a rapid disappearance of albumin, usually complete in forty-eight hours; in a rapid decline in the arterial tension; in an early reestablishment of the vesical reflex with abundant spontaneous urination; in an absence of posteclamptic delirium or amnesia.

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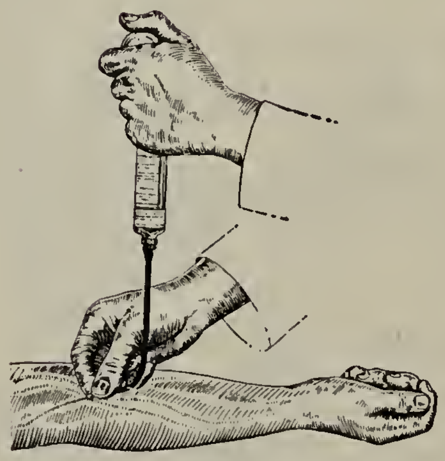

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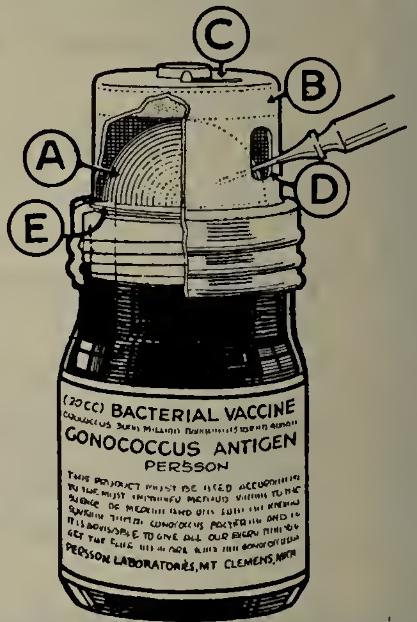

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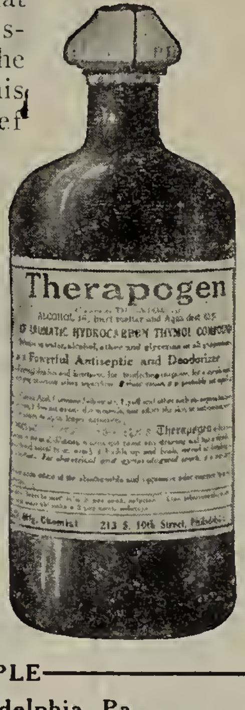

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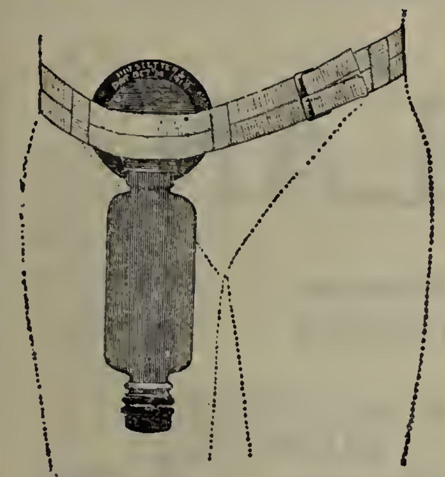

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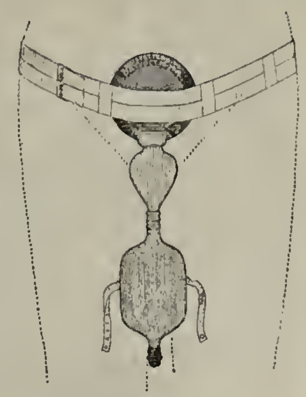

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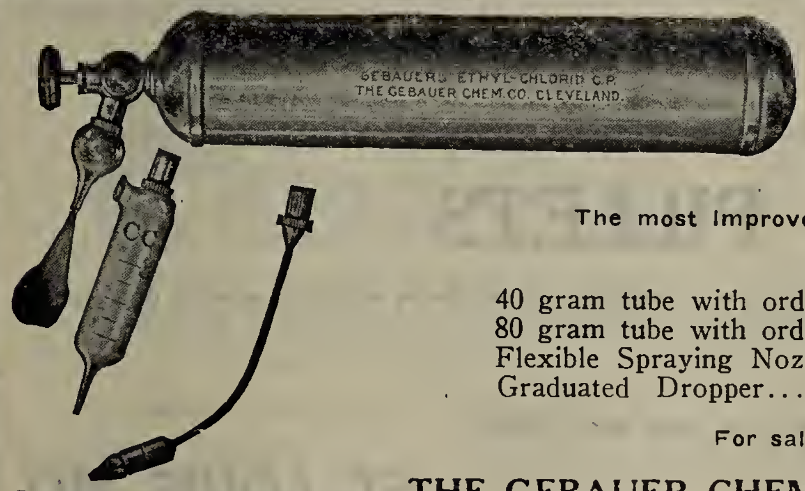

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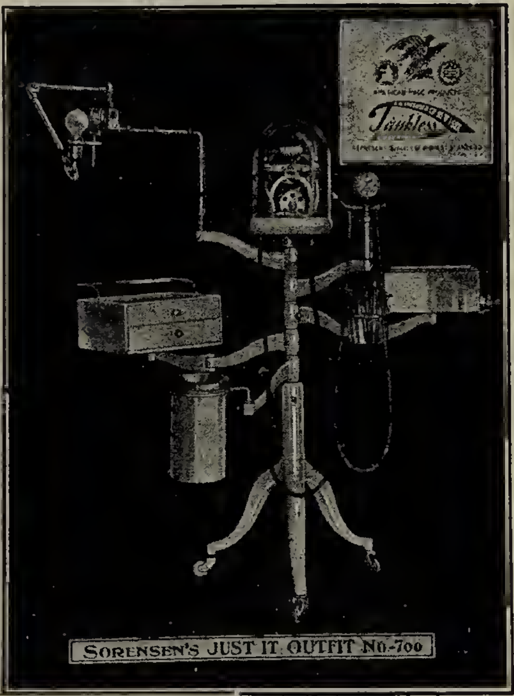

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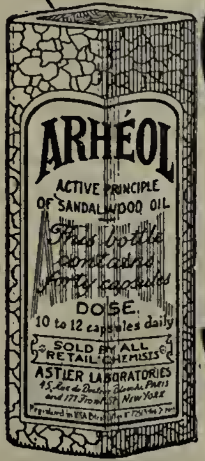
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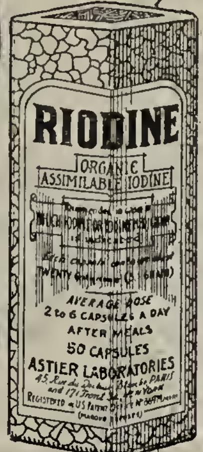
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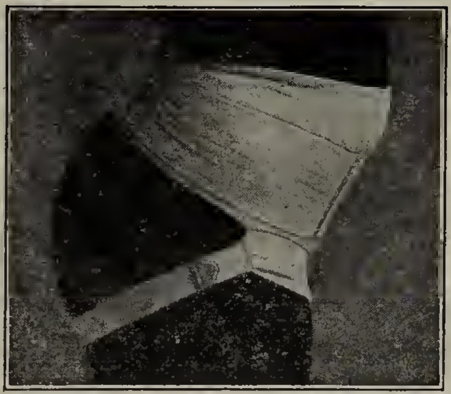

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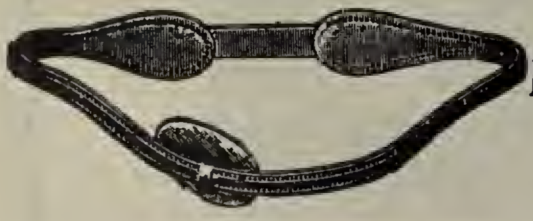

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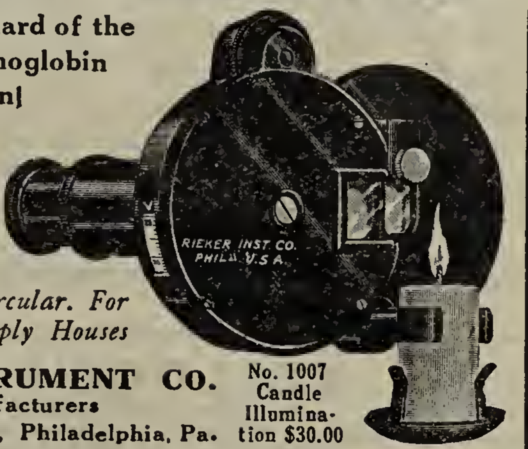

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